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THE

Robt EDINBURGH *Roberts*.

NEW DISPENSATORY:

CONTAINING

- I. THE ELEMENTS OF PHARMACEUTICAL CHEMISTRY.
- II. THE MATERIA MEDICA; OR THE NATURAL, PHARMACEUTICAL, AND MEDICAL HISTORY, OF THE DIFFERENT SUBSTANCES EMPLOYED IN MEDICINE.
- III. THE PHARMACEUTICAL PREPARATIONS AND COMPOSITIONS.

INCLUDING

Complete and Accurate Translations of the Octavo Edition of the London Pharmacopœia, published in 1791; Dublin Pharmacopœia, published in 1794; and of the New Edition of the Edinburgh Pharmacopœia, published in 1805.

Illustrated and explained in the Language, and according to the Principles, of
MODERN CHEMISTRY.

WITH MANY NEW AND USEFUL TABLES; AND
Several COPPERPLATES, explaining the new System of Chemical Characters, and representing the most useful Pharmaceutical Apparatus.

By ANDREW DUNCAN, Jun. M.D.

*Fellow of the Royal College of Physicians and Royal Society of Edinburgh, and
Associate of the Linnean Society of London.*

THIRD EDITION.

EDINBURGH:

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UNIVERSITY
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LONDON.

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1808.

TO

ANDREW DUNCAN, M.D.

PROFESSOR OF THE INSTITUTIONS OF MEDICINE
IN THE UNIVERSITY OF EDINBURGH,

THIS WORK

IS MOST DUTIFULLY AND AFFECTIONATELY INSCRIBED,

BY

HIS SON.

TO

ANDREW DONALD, M.D.

PROFESSOR OF THE INSTITUTIONS OF MEDICINE
IN THE UNIVERSITY OF EDINBURGH,

THIS WORK

IS MOST DUTIFULLY AND AFFECTIONATELY INSCRIBED.

BY

HIS SON.

PREFACE.

DR. LEWIS published the first edition of his *New Dispensatory* in 1753. The principal part of the work was a commentary upon the London and Edinburgh Pharmacopœias, of both of which it contained a complete and accurate translation. A concise system of the Theory and Practice of Pharmacy was prefixed, as an introduction; and directions for extemporaneous prescription, with many elegant examples, and a collection of efficacious, but cheap remedies, for the use of the poor, were added as an appendix.

The manner in which the whole was executed, placed Dr. LEWIS at the head of the reformers of Chemical Pharmacy; for he contributed more than any of his predecessors to improve that science, both by the judicious criticism with which he combated the erroneous opinions then prevalent, and by the actual and important additions he made to that branch of our knowledge. He was justly rewarded by the decided approbation of the public. During the author's lifetime, many editions were published, each succeeding one receiving the improvements which the advancement of the sciences connected with Pharmacy suggested.

After the death of Dr. LEWIS, Dr. WEBSTER and Dr. DUNCAN successively contributed to maintain the reputation of the work, by taking advantage of the discoveries made in natural history and chemistry; and by making those alterations which new editions of the Pharmacopœias on which it was founded rendered necessary. From the place of their publication, and

to distinguish them from the original work of Dr. LEWIS, which was still reprinted, without alteration, in London, these improved editions were entitled, *The EDINBURGH New Dispensatory*.

When the Edinburgh Collge some time ago determined to publish a new edition of their Pharmacopœia, the booksellers who published the copy-right of that work were desirous it should be accompanied by a corresponding Dispensatory. Indeed, since the year 1788, when my father revised it, it had undergone no material alteration, although it has been often reprinted with the name of another editor. During that period the progress of chemistry, pharmacy, and natural history has been so great, as to render a complete reform absolutely necessary. This, to the best of my abilities, I have attempted; and how great and important the alterations have been, will appear from the following analysis.

The general plan of the work remains the same. It is divided into three parts. The first contains Elements of Pharmacy; the second, the Materia Medica; and the last, the Preparations and Compositions.

The *first* of these is entirely new, nothing being retained but the title. It is divided into two sections. The first contains a very concise account of some of the general doctrines of *Chemistry*, and of the properties of all simple bodies, and the generic characters of compound bodies. In the second part, the *Operations of Pharmacy*, and the necessary apparatus, are described; and an Appendix is added, containing many very useful tables, and the explanation of the plates.

The principal addition to the second and third parts of this work, is the introduction of a complete translation of the excellent Pharmacopœia of the Dublin college,* which has never

* Since the publication of the first edition of this Dispensatory, I have learned that the introduction of this translation was incorrect, as the original was not a published work, but printed only for the inspection of the friends of that college. The error was unintentional, and has, I trust, not derogated from the reputation of the Dublin college, while it has certainly promoted the object they had in view, the improvement of pharmacy.

appeared before in the English language. I therefore trust, that it will be found an important and valuable addition. In Ireland, in particular, it must give the *Edinburgh New Dispensatory* an interest which it did not formerly possess.

The *second part* contains the *Materia Medica*, arranged in alphabetical order. The alterations in this part are also very considerable. I have adopted the nomenclature of the Edinburgh college, or rather of natural history, in preference to the officinal names hitherto employed. To the systematic name of each article are subjoined its synonymes in the different Pharmacopœias, and the designations of the parts used in medicine; then the class and order of natural bodies to which it belongs; and if a vegetable, the exact number of its genus and species, according to the excellent edition of LINNÆUS's *Species Plantarum*, now publishing at Berlin, by Professor WILLDENOW.

The ancient practice of naming medicines from their inventors or supposed virtues, has been for some time exploded from our Pharmacopœias; but it has been long customary to describe both simple substances and their preparations or compositions, by what are generally termed Officinal names, in contradistinction to the present systematic names of the same substances. But their officinal names are in fact the old systematic names, which were unaccountably retained for the denomination of medicinal substances, after the improvements in natural history and chemistry rendered the introduction of a new nomenclature into these sciences necessary.

Attempts have been made, both in this country and in Germany, to introduce the language of chemistry into pharmacy; but these attempts, however useful, were but feeble and incomplete. The honour of being the first to compose a Pharmacopœia in the pure and unmixed language of science, belongs indisputably to the Royal College of Physicians of Edinburgh, in the beginning of the nineteenth century. To this innovation many objections have been made, but they rather apply to the

necessary imperfections of a first attempt, than to the principle itself, the propriety of which can scarcely be doubted, when we consider that *Materia Medica* and *Pharmacy* are but an application of *Natural History* and *Chemistry* to a particular purpose. If the general principle be admitted, it naturally follows, that the names of all substances employed in medicine should be the same with the names of the same substances, according to the most approved systems of *Natural History* and *Chemistry*; and that the titles of compound bodies should express as accurately as possible the nature of their composition.

Considerable difficulties, however, occur, in attempting to form a nomenclature in strict conformity with these principles. The most apparent of these is, that the titles of the more compounded medicines would become too verbose and inconvenient, if they were to express every ingredient, although of little importance. The college, fully aware of this difficulty, have therefore contented themselves with indicating in the titles the principal ingredients only, on which their powers and uses seem to depend; and when it was necessary to introduce more, or to add the epithet *compositus*, they have endeavoured to abbreviate them systematically. For the same reason, they have prescribed some well-known simples in very frequent use, by their common names, such as *Opium*, *Manna*, *Moschus*, *Castoreum*, thinking it sufficient to have pointed out in the catalogue of the *Materia Medica* the animals and vegetables from which they are obtained.

In most cases, it is proper to mention both the generic and specific names of simples; but where it is necessary to point out even the variety employed, it will be in general more convenient to omit the specific name, and to retain those of the genus and variety, as *Aloes Socotorina* for *Aloes perfoliata Socotorina*, *Crocus Anglicus* for *Crocus sativus Anglicus*. Also when any substance is obtained indiscriminately from several species of the same genus, the specific name may be omitted with propriety. Thus, it is sufficient to say, *Resina pini*, *Oleum volatile pini*, &c.

Another difficulty arises from the reformers of chemical nomenclature not having pointed out the manner of expressing certain, and these very common, forms of combination, without employing a periphrasis totally incompatible with the brevity of a name. Pharmacutists have therefore been obliged to supply this deficiency from their own store.

The Edinburgh College have accordingly retained some titles, such as *Tincture* and *Spirit*, which, although not strictly chemical, have been long received in Pharmacy, and are so well understood and defined, that they can lead to no error or ambiguity.

The principles, therefore, upon which the Edinburgh College have established the new nomenclature which they have introduced into *Materia Medica* and Pharmacy, appear to be so rational and scientific, that it can scarcely fail to be generally adopted. As science advances, its imperfections will be remedied, and its deficiencies supplied; for, besides other advantages, it facilitates remarkably the application of discoveries and improvements in Natural History and Chemistry, to the purposes of medicine.

In other particulars, considerable additions have been made to the natural history of the different articles, to the means of distinguishing them from other substances with which they are apt to be confounded, and of detecting frauds and adulterations. Almost every thing which regards their chemistry is entirely new. As from the principal list every article has been excluded which is not contained in the *Materia Medica* of at least one of the British Colleges, I have given, in an Appendix, a very concise account of such other articles as possess a place in some respectable foreign Pharmacopœias. I have also added lists of the Medicinal Simples, arranged according to the best systems of Natural History.

The *third part* contains the *Preparations and Compositions*.

In the general arrangement of these, I have not followed any of the Colleges exactly, although I have not deviated much from that of the Dublin Pharmacopœia. It is not of very great

importance in what order the classes or chapters be arranged ; but these classes should be natural, and, if possible, established on one general principle. Unfortunately, however, in most Pharmacopœias, some of the classes are founded on chemical analogy, and others on the similarity of form, or mode of preparation ; and what is still worse, some are entirely anomalous and unnatural. The last error I have carefully endeavoured to avoid, but I have not attempted, and indeed it seems scarcely possible, to form an useful arrangement, on a single principle. The analogous preparations in the different Pharmacopœias, are always placed immediately next each other, which renders it easy to compare them, and to discover at once the circumstances in which they resemble, or differ from, each other.

Concerning this third edition, it is only necessary to mention, that it contains the many corrections and improvements made by the Edinburgh College, when they republished their Pharmacopœia in 1805.

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THE EDINBURGH NEW DISPENSATORY.

PART I.

ELEMENTS OF PHARMACY.

1. **T**HE object of Pharmacy is to provide those substances which may be employed for the prevention or cure of diseases.

2. To obtain this object completely, an acquaintance with the physical and chemical properties of bodies is necessary. This may be termed the Science of Pharmacy.

3. As few substances are found in nature in a state fit for their exhibition in medicine, they previously undergo various preparations. These constitute the Art of Pharmacy.

4. Pharmacy is so intimately connected with Chemistry, that the former can neither be understood as a science, nor practised with advantage as an art, without a constant reference to the principles of the latter. For this reason, it will be proper to premise such a view of the general doctrines of chemistry, and of the most remarkable properties of chemical agents, as is necessary for the purposes of pharmacy.

SECT. I.

EPITOME OF CHEMISTRY.

5. Matter is extended and divisible.

6. The most minute particles into which bodies can ultimately be divided are called their *Elementary particles*.

7. The most minute particles into which any substance can be divided, similar to each other, and to the substance of which they are parts, are termed its *Integrant particles*.

8. When the integrant particles admit of no further division, the body is a *Simple Substance*.

9. But the integrant particles of most bodies can be subdivided into other particles, differing in their nature from each other, and from the body of which they are parts. These bodies are called *Compound Bodies*.

10. If the particles, of which the integrant particles of any compound body are composed,

a. admit of no further division, the body is a *Primary Compound*;

b. but if they be also compound, and admit of still further subdivision, they are called *Intermediate Particles*, and the body is a *Secondary Compound*.

11. Therefore the integrant particles

a. of simple substances are also their elementary particles;

b. of primary compounds are composed of elementary particles;

c. of secondary compounds are composed of intermediate particles.

12. The phenomena of matter are regulated by attraction and repulsion.

ATTRACTION.

13. Attraction comprehends those forces which cause bodies to approach towards each other.

14. It operates

a. at sensible distances, as in the attractions of gravity, electricity, and magnetism;

b. at insensible distances;

a a. between particles of the same species, constituting the attraction of cohesion or aggregation;

b b. between particles of different species, the attraction of composition or affinity.

REPULSION.

15. Repulsion tends to separate bodies from each other.

16. It also operates either

a. at sensible distances, as in the repulsion of electricity and magnetism; or,

b. at insensible distances, as in the repulsion of the matter of heat or caloric.

17. The phenomena resulting from the operation of the second class of attractions (14. b.), and second class of repulsions (15. b.) constitute the proper objects of chemistry.

AGGREGATION.

18. Bodies exist under different forms of aggregation :
- a. Solid, in which the attraction of cohesion resists relative motion among the particles, either
 - a a. perfectly, as in hard bodies ; or
 - b b. imperfectly, as in soft, malleable, ductile, and elastic bodies.
 - b. Fluid, in which it admits relative motion among the particles, either with facility, as in perfect fluids ; or difficultly, as in viscid fluids.
 - c. Gaseous, in which the particles repel each other.

AFFINITY.

19. Affinity is regulated by the following laws :
- a. It does not act at sensible distances.
 - b. It is exerted only between particles of different species.
 - c. It is exerted by different bodies, with different degrees of force.
 - d. The action produced by different affinities, existing in one substance, is called *Resulting Affinity*.
 - e. It is the inverse *ratio* of saturation.
 - f. It increases with the mass, that is, the absolute weight of any body multiplied by the degree of its affinity.
 - g. Its action is influenced by cohesion, elasticity, and temperature.
 - h. It is often accompanied by a change of temperature.
 - i. Substances, chemically combined, acquire new properties ;
 - k. And cannot be separated by mechanical means.
20. Affinity is
- a. simple, when two bodies unite, in consequence of their mutual attraction alone, whether these bodies be themselves simple or compound, and even although, in the latter case, it be attended with decomposition.
 - b. compound, when there is more than one new combination, and when the new arrangement would not have taken place, in consequence of the attractions tending to produce either combination singly.
 - c. disposing, when bodies, which apparently have no tendency to unite, combine, in consequence of the addition of another body, which has a strong affinity for the compound.

When the science of chemistry comes to be better understood, all the cases at present referred to this last species of affinity, will probably be found to belong to one of the preceding species: for, it is absurd to suppose, that a body can possess affinities before it is formed.

binary, ternary, quaternary, &c. according to the number of their constituents.

b. secondary compounds (10. *b.*) consisting of compound bodies combined with simple bodies, or with each other.

26. This division is entirely arbitrary, as we are in fact ignorant of what are really simple bodies, and cannot ascertain the manner of combination in bodies compounded of three or more elements. The division, however, is convenient.

27. As the chemical nature of bodies is determined by their action on each other, and as, in every case, we should endeavour to advance from what is known, to what is not known, the simple substances will first be described, and then such of the primary compounds which they form with substances already treated of as are not more conveniently arranged in separate classes.

LIGHT.

28. Light emanates in every direction from visible bodies.

29. It moves in straight lines, with a velocity equal to 200,000 miles in a second.

30. Its gravity is not appreciable.

31. When a ray of light passes very near a solid body, it is *inflected* towards it.

32. When it passes at a distance somewhat greater, it is *deflected* from it.

33. When a ray of light falls upon a polished surface, it is *reflected* from it, and the angle of reflection is equal to the angle of incidence.

34. Bodies which do not allow light to pass through them are termed *Opaque*.

35. Bodies which allow it to pass freely through them are termed *Transparent*.

36. When a ray of light passes obliquely from one medium into another of greater density, it is bent towards the perpendicular; but if the second medium be of less density, it is bent from the perpendicular. The light, in both cases, is said to be *Refracted*.

37. The refracting power of bodies is proportional to their densities, except with regard to inflammable bodies, of which the refracting power is greater than in proportion to their densities.

38. By means of a triangular prism, light is separated by refraction into seven rays; red, orange, yellow, green, blue, indigo, and violet.

39. These rays are permanent, and suffer no further change by reflection or refraction.

40. They differ in flexibility and refrangibility; the red possessing these properties in a less degree than the orange, the orange than the yellow, and so on in the order of their enumeration.

41. They possess different powers of illumination. It is greatest between the yellow and green, and gradually declines towards both ends of the spectrum.

42. The different colours of bodies depend on their transmitting or reflecting those rays only which constitute their particular colours.

43. White consists of the whole prismatic rays united.

44. Black is the total absence of light, or complete suffocation of all the rays.

45. The sun's rays possess the power of heating bodies.

46. The heating power of the different rays is inversely as their refrangibility. But as this power is greatest at some distance beyond the red end of the visible spectrum, it is probable that it is totally independent of the colorific rays.

47. Bodies are heated by light inversely as their transparency, and directly, as the number of rays suffocated by them.

48. The sun's rays possess the chemical property of separating oxygen from many of its combinations.

49. The disoxygenizing power of the different rays is in proportion to their refrangibility. But as this power is greatest at a small distance beyond the violet end of the visible spectrum, it is probable that it is totally independent of the colorific or calorific rays.

50. Light is absorbed by many bodies, and again emitted by them in the dark.

51. The sources of light are the sun's rays, combustion, heat, and percussion.

52. Light is supposed by many to exist in a latent state in all combustible bodies.

CALORIC.

53. Heat, in common language, is a term employed to express both a certain sensation, and the cause producing that sensation. In philosophical language, it is now confined to the sensation, and the term *Caloric* has been substituted to express the cause.

54. *Temperature* is that state of any body, by which it excites the sensation of heat or of cold, and produces the other effects which depend on the excess or deficiency of caloric.

55. The most general effect of caloric is expansion; the only real exception to this law being the contraction of water from the lowest temperature at which it can remain fluid, to 42.5° F. This expansion either consists,

a. in a simple increase of volume; or

b. it produces a change of form in the substance heated.

56. The former species takes place gradually, and at all tem

peratures, as long as the bodies expanded undergo no other change.

57. Bodies differ very much in the degree of expansion which equal increments of temperature produce in them. Gases are more expansible than fluids, fluids than solids. The individuals of each form of aggregation also exhibit considerable differences.

58. The second species occurs suddenly, and always at certain degrees of temperature.

59. The degree at which any solid is rendered fluid by means of caloric, is denominated its point of fusion; and that at which either a solid or a fluid is converted into vapour, is its boiling point, or point of vaporization. Vaporization is much retarded by increase of pressure, and facilitated by its diminution, in so much, that those substances which, under the ordinary pressure of the atmosphere, seem to pass at once from the state of solid to that of vapour, may, by the application of sufficient pressure, be made to assume the intermediate state of fluidity; while, on the contrary, all fluids which have been hitherto tried, begin in a vacuum to boil and omit vapour, when their temperature is lower by 120° at least than their vaporific point, at the ordinary pressure of the atmosphere.

60. From analogy, all bodies are considered as solid, when totally deprived of caloric; but they are termed solid, fluid, or gaseous (18.), according to the state in which they exist at the ordinary temperature of the atmosphere. They are also termed fusible, or infusible, volatile, or fixed, condensible, or permanently elastic, according to the effects of caloric upon them.

61. Another very general effect of caloric, is increase of temperature.

a. This effect is constant when bodies retain their form of aggregation, or undergo the gradual species of expansion (55. a.);

b. but while they undergo the sudden species (55. b.) they remain at one determinate temperature, that necessary for their fusion or vaporization, until the change be completed throughout the whole.

62. During the time necessary to effect this, the influx of caloric continues as before, and as it does not increase the temperature, it is said to become latent or combined.

63. The caloric necessary for these changes (61. b.) is best denominated the caloric of fluidity, and the caloric of vaporization; and its quantity, is determinate with regard to each substance.

64. The absolute caloric, or total quantity of caloric contained in any body, is perfectly unknown; but the quantity which increases the temperature of any body a certain number of degrees, is termed its Specific caloric; (Capacity for caloric, of Black, Crawford, and others), when its weight is the object of comparison; and by Dr Thomson, its Capacity for caloric, when its

volume is considered. The specific, and therefore the absolute, caloric of bodies, varies very much.

65. Incandescence is the least general effect of caloric, as it is confined to those substances which are capable of supporting the very high temperature necessary for its production, without being converted into vapour or gas.

66. On the living body caloric produces the sensation of heat, and its general action is stimulant. Vegetation and animal life are intimately connected with temperature, each climate supporting animals and vegetables peculiar to itself.

67. Caloric influences affinity, both on account of the operation of its own affinities, and of its facilitating the action of bodies, by counteracting cohesion (18). For the latter reason, it also promotes solution, and increases the power of solvents.

68. The particles of caloric repel each other: it is therefore disposed to fly off in every direction from a body in which it is accumulated, or to pass off by radiation.

69. Caloric is attracted by all other bodies.

70. It has therefore an irresistible tendency so to distribute itself as to produce an universal equilibrium of temperature, or to pass from bodies in which it is accumulated, into bodies in which it is deficient, until the attraction of each for caloric, and the repulsive force (67) of the caloric contained in each become equal to each other.

71. Caloric is radiated most slowly by polished metallic surfaces, and most quickly by rough blackened surfaces.

72. Radiated caloric is admitted most readily by rough blackened surfaces, and most difficultly by polished metallic surfaces.

73. Radiated caloric is transmitted with the velocity of light; and, like it, it is reflected and refracted.

74. But the passage of caloric through most bodies is immensely slower than radiated caloric.

75. When caloric moves through bodies with this diminished velocity, it is said to be conducted by them. Metals are the best conductors; then stones, glass, dried wood. Spongy bodies, in general, are bad conductors. Fluids also conduct caloric; but as they admit of intestine motion among their particles, they carry it more frequently than they conduct it.

76. If affinity for caloric has any influence on the conducting power of bodies, it must increase it, or their conducting power must be directly as their affinity for caloric.

77. The general effects of the abstraction of caloric, are diminution of volume, condensation, diminution of temperature, and sensation of cold. It also influences affinity, and, in general, retards solution. The abstraction of caloric never can be total; and the attempts to calculate the thermometrical point at which it would take place, although ingenious, are not satisfactory. Those most worthy of confidence place it about $+1500^{\circ}$ F.

(76.) The means employed to increase temperature are, the rays of the sun, collected by means of a concave mirror, or double convex lens, electricity, friction, percussion, collision, condensation, and combustion. Temperature is diminished by rarefaction, evaporation, and liquefaction.

(77.) Temperature is estimated relatively by our sensations, and absolutely by means of various instruments. The thermometer indicates temperature by the expansion which a certain bulk of fluid undergoes from the addition of caloric, and by the condensation produced by its abstraction. Mercury, from the uniformity of its expansion, forms the most accurate thermometer; but for temperatures in which mercury would freeze, alcohol must be employed. Air is sometimes used to shew very small variations of temperature. The pyrometer of Wedgwood, which is employed for measuring very high temperatures, depends upon the permanent and uniform contraction of pure clay at these temperatures.

ELECTRICITY.

78. The particles of the electric fluid repel each other, with a force decreasing as the distances increase.

79. They attract the particles of other bodies, with a force decreasing as the distances increase; and this attraction is mutual.

80. They are dispersed in the pores of other bodies, and move with various degrees of facility through different kinds of matter.

a. Bodies, through which they move without any perceivable obstruction, are called Non-electrics.

b. Bodies, through which they move with very great difficulty, are called Electrics.

81. The phenomena of electricity arise

a. from the actual motion of the fluid from a body containing more into another body containing less of it;

b. from its attraction or repulsion, independently of any transference of fluid.

82. By rubbing electrics on each other, the distribution of the electric fluid in them is altered. On separating them, the one contains more, and the other less, than the natural quantity; or, the one becomes positively, and the other negatively electrified.

83. Electrics may also be excited by rubbing them with non-electrics.

84. If a body B be brought into the neighbourhood of an electrified body A, B becomes electrified by position.

85. If a body B be insulated, that is, in contact with electrics only, when brought into the neighbourhood of an electrified body A, a spark passes between them, accompanied by noise.

B becomes permanently electrified, and the electricity of A is diminished.

86. When a body A has imparted electricity to another body B, they repel each other, unless B shall have afterwards imparted all its electricity to other bodies.

87. Bodies repel each other, when both are positively or both negatively electrified.

88. Bodies attract each other, when the one is positively and the other negatively electrified.

89. If either of the bodies be in the natural state, they will neither attract nor repel each other.

90. The spark (84.) is accompanied by intense increase of temperature (75.), and will kindle inflammable bodies.

91. It produces very remarkable chemical effects, depending chiefly on sudden and momentary increase of temperature, and on the light produced.

92. Electricity acts on the living system as a stimulus.

GALVANISM.

93. The phenomena of galvanism seem to depend solely on the agency of electricity, excited during certain chemical actions.

94. It is excited by arranging at least three heterogeneous bodies; for instance, two metals and a fluid, in such a manner, that the two metals be in direct contact with each other, in one part, and have the fluid interposed between them in another.

95. The pile of Volta, by which it is rendered most manifest, is constructed, by combining a series of simple galvanic arcs (93.) into one continuous circle, in one uniform order of arrangement.

96. The solids capable of exciting galvanism, are the metals and charcoal; and the most efficient fluids are certain saline solutions.

97. The effects of the simple galvanic circle (93.) on the animal body, are the production of a sensation of light when applied to the eye; of an acid taste on the tongue; and the excitement of the muscles through the medium of the nerves.

98. The pile, when well constructed, besides these effects, also gives a shock and spark resembling those of electricity (84.), and proves, that the galvanic action is always accompanied by the decomposition of the fluid, and a combination of one of its constituents with one of the metals.

MAGNETISM.

99. If an oblong piece of iron be suspended freely, it will assume a determinate position with regard to the axis of the earth.

100. When the same end always points in the same direction, it is said to possess polarity, or to be a magnet.

101. The similar poles of two magnets repel each other; and the dissimilar poles attract each other with a force decreasing as the distances increase.

102. Any piece of iron, when in the neighbourhood of a magnet, is a magnet; and its polarity is so disposed, that the magnet and iron mutually attract each other.

103. Magnetism does not seem to affect sensibility or irritability, or to influence chemical action.

SALIFIABLE BASES.

104. The great bulk of this globe consists of earths and stones. Although these vary infinitely in their external character and physical properties, they are found to consist of a very few substances, mixed together in different proportions, and modified by external agents.

105. These elementary substances are termed *Earths*. Their general characters are, total want of inflammability, infusibility, fixedness, a specific gravity less than 5, inalterability, whiteness, dryness, brittleness, sparing solubility in water, and, in general, insipidity and want of smell, capability of forming chemical compounds with acids, alkalies, sulphur, phosphorus, and oils, and fusibility when mixed with each other, or with alkalies, into colourless glasses, enamels, or porcelains.

106. *Alkalies* are a class of bodies which are commonly defined to be incombustible, soluble in water, caustic, and capable of neutralizing the acids, of combining with alcohol, oils, earths, sulphur, and phosphorus, and of changing vegetable blues and reds to green: But as many of these properties are possessed in a greater or less degree by substances usually classed with the earths, and as there is a continual gradation from the insipidity, insolubility, and infusibility of silica, to the causticity, solubility, fusibility, and comparative volatility of potash, they are sometimes classed together under the general name of *Salifiable Bases*.

EARTHS.

107. *Silica*, when obtained perfectly pure by art, is in the form of a very fine powder, hard, rough, and gritty, to the touch; when applied to the tongue, giving a rough and dry sensation, but without taste or smell, having a specific gravity of 2.66; when completely disaggregated, soluble in 1000 times its weight of water; soluble in the fixed alkalies and fluoric acid; fusible with the fixed alkalies and other earths; and combining by fusion with the metallic oxides, and the phosphoric and boracic

acids. It has a tendency to crystallization, and its ultimate particles seem to be transparent. It in general imparts to the fossils of which it is a principal constituent, transparency, lustre, a tendency to crystallization, and a degree of hardness, enabling them to strike fire with steel. Rock-crystal, quartz, agate, flint, calcedonyjasper, shorl, are example of siliceous stones.

108. *Zirconia* is obtained in the form of a fine white powder, almost soft to the touch; without taste or smell; having, in a state of aggregation, a specific gravity of 4.3; insoluble in water; infusible by heat alone, but, when surrounded by charcoal, its particles become agglutinated, and so hard as to strike fire with steel; soluble in all the acids; fusible with flux and alumina; insoluble in the alkalies, but soluble in their carbonates. It is only found in the zircon or jargon of Ceylon, and in different varieties of hyacinth.

109. *Alumina* is obtained in friable fragments, or in a very fine white powder; soft and unctuous to the touch; adhering strongly to the tongue, absorbing its moisture, and producing a slightly styptic effect upon it; specific gravity 2; insoluble in water, but very diffusible through it; absorbing a certain quantity of it rapidly, and forming with it a very ductile adhesive paste, which contracts and hardens remarkably in the fire, but is perfectly infusible. Its ultimate particles seem to be opaque. It combines with most of the acids, and these compounds have a sweetish styptic taste; it unites with charcoal, the alkalies, baryta, strontia, lime, and silica; it is manufactured into porcelain and glass. Fossils, containing much alumina, have generally a laminated structure; it exists crystallized in sapphire; and it forms the basis of all clays, boles, mica, trap, basalt, slate, and corundum.

110. *Yttria* (Gadolina) is obtained in the form of a fine white powder, without taste or smell; insoluble in water; it does not alter vegetable blues; is infusible; insoluble in the alkalies, but readily soluble in the carbonate of ammonia. With the acids it forms salts, which have a sweet and somewhat austere taste. It has been found only in the gadolinite.

111. *Glucina* is obtained in white light masses or powder, of a soft feel, insipid, but adhering strongly to the tongue; apyrous; and insoluble in water, but forming with it a paste, slightly ductile and adhesive; it is soluble in potash, soda, and carbonate of ammonia: it combines with most of the acids, forming soluble salts, difficultly crystallizable, of a sweet and somewhat astringent taste, and with sulphuretted hydrogen. It has hitherto been found, very sparingly, only in the beryl and emerald.

112. *Magnesia* is obtained in light white friable masses, or very fine powder; to the touch it is very fine; its taste is not very sensible, but peculiar and pleasant; its specific gravity is 2.33. It is insoluble in water, but forms with it a paste with-

out ductility. It is apyrous; slightly alters vegetable blues to green; forms soluble compounds with most acids, and unites with sulphur. The fossils, in which it predominates, are generally soft, and have an unctuous feel; the principal are talc, steatites, asbestos, &c. *Officinal.*

113. *Lime* is obtained in the form of a grey stone, or in fragments more or less pulverulent and white; warm, acrid, and urinous to the taste; reddening the skin when applied to it for any time; specific gravity 2.33. It is soluble in 450 times its weight of water, and has a strong attraction for it. If a certain quantity of water be thrown upon fresh burnt lime, it is absorbed rapidly, with the extrication of considerable heat, and some phosphorescent light; at the same time the lime crumbles down into a very fine, white, dry powder, augmented much in bulk, but less caustic than before. Lime, thus slaked, does not renew these phenomena, on a further addition of water, but may be diffused or dissolved in it. It is apyrous; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus; it is very abundant in the mineral kingdom, and forms the bases of animal bones and shells. The calcareous spars, marble, limestone, chalk, and marl, consist chiefly of lime. *Officinal.*

114. *Strontia* is obtained in small, whitish grey, and often porous masses; its taste is warm, acrid, and urinous; it is slightly caustic, acting feebly on animal matters. Taken into the stomach, it is not poisonous; its specific gravity is nearly 4.; it is soluble in 200 times its weight of water at 50° , but in little more than six times its weight of boiling water, which, on cooling, deposits flat rhomboidal crystals; it is slaked more rapidly than lime, and it is infusible; it changes vegetable blues to green; it combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus, alumina, and silica. It is the basis of some of the heavy spars.

115. *Baryta* is obtained in small, grey, porous masses, of tolerable solidity; its taste is acrid, urinous, and pungent; applied to the skin, it proves caustic, and it is deleterious when swallowed; its specific gravity is 4; it is soluble in twenty times its weight of cold water, and in twice its weight of boiling water; depositing, on cooling, transparent, white, prismatic crystals; when slaked, it boils up with violence, becomes very hot, increases in bulk, and is changed into a spongy white mass. It changes vegetable blues to green; it is fusible; and combines with all the acids, sulphur, sulphuretted hydrogen, and phosphorus. It is the basis of some of the heavy spars.

ALKALIES. (106.)

116. *Soda* is got in the form of solid plates, of a greyish-white

colour, urinous taste, and burning causticity; acting with considerable violence on animal matter. When a certain quantity of water is thrown upon it, it absorbs and solidifies it, with the disengagement of caloric, and a lixivial smell; a larger quantity dissolves it; it absorbs from the atmosphere moisture and carbonic acid, becoming less caustic. In the fire it melts like an oily substance; boils, and is converted into vapour; but is incombustible: it is crystallizable into transparent prismatic crystals. It changes vegetable blues to green; unites with all the acids, oils, sulphur, sulphuretted hydrogen, phosphorus, many metallic oxides, and the earths. It forms the basis of rock-salt, and sea-salt; is obtained from the ashes of marine plants, and exists in some minerals.

117. *Potass* is a solid, white substance; extremely acrid to the taste; unctuous to the feel, but highly caustic; destroying the skin, and dissolving all soft animal substances. It is deliquescent and soluble in half its weight of water at 50° Fahrenheit; it is fusible, and may be vaporized, but is perfectly incombustible; it is capable of crystallizing into very long quadrangular, compressed prisms, terminated by sharp pyramids; it changes vegetable blues to green, and combines with all the acids, oils, sulphur, sulphuretted hydrogen, and the earths. It is obtained from the ashes of vegetables, and exists in some minerals. *Official.*

118. *Ammonia* is always classed with the alkalies, from the analogy of its taste, causticity, combinations with the acids, and effects upon vegetable blues; but as it differs in many particulars, being extremely volatile, and a compound substance, readily decomposed, and formed in many chemical operations, and its composition well known, I have ventured to separate it from the alkalies, and refer it to that place, which, in all probability, it will always retain, and to which the other alkalies will, perhaps, be referred, when their composition shall be detected. *Official.*

PRIMARY COMPOUNDS OF THE SALIFIABLE BASES.

A. With each other; earthen-ware; glass.

B. With sulphur; alkaline and earthy sulphurets.

C. With phosphorus; alkaline and earthy phosphurets.

119. The substances of this class exert a considerable action on each other. Potass was long believed to be the only solvent of silica; and it is now further proved, that the whole of this class are capable of combining, when presented to each other in a state of solution; and on this property, in part, the effect of mortars depends. Their action on each other, by means of heat, is of much greater importance, as it includes the theories of the manufactures of porcelain and glass.

120. Porcelain, and all kinds of earthen ware, consist of alumina and silica, mixed in different proportions into a plastic mass, fabricated into various shapes, dried and exposed to the heat of a furnace, where they undergo a kind of semifusion. They are glazed by being thinly covered with a more fusible composition, and may be afterwards painted with enamels, which are still more fusible than the glazing.

121. Glass is composed by melting about equal parts of potash or soda with silica. It is harder and more durable in proportion to the excess of the silica. The transparency of glass depends upon its being cooled quickly; for if cooled very slowly, it assumes a radiated crystalline appearance, and becomes perfectly opaque. By melting silica with about three times its weight of soda or potash, a glass is obtained, which not only is soluble in water, but even attracts moisture from the atmosphere. This solution has long been known by the name of Liquor of Flints. The property which metallic oxides have of rendering glasses more fusible, and of imparting to them certain colours, has given rise to the arts of imitating precious stones, and of enamelling.

OXYGEN.

122. *Oxygen* is the principle on which most of the chemical qualities of atmospheric air depend. Its tendency to combination is so very strong, that it has never been procured in a separate. Oxygen gas, or the combination of oxygen with caloric, is its most simple form. This is permanently elastic, compressible, transparent, inodorous, and insipid. Its specific gravity is 0.00135. It supports inflammation; is necessary for respiration and vegetation, and is decomposed in all these processes; it constitutes 0.22 of atmospheric air. Oxygen is also a principal constituent in water, in all acids and metallic oxides, and in almost all animal and vegetable substances. It is separated from many of its combinations by the sun's rays, (48.)

OXYGENIZEMENT.

123. As the characteristic distinction between the simple substances already treated of, and those which remain to be examined, consists in the former possessing no affinity whatever for oxygen, and in the latter having a more or less strong attraction for it, it will be proper to explain in this place, the general phenomena which attend the combination of oxygen with oxygenizable bases. The term Combustion has been by the French chemists incorrectly extended to all these combinations; for, in common language, that word is applied to cases in which oxygen is not an agent, and always supposes the production of heat and

light, although in numberless instances of oxygenizement these phenomena do not appear.

124. Oxygenizement is an example of chemical union, and is subjected to all the laws of affinity, (19.). It requires the presence and contact of oxygen, and of another substance possessing affinity for it.

125. Oxygenizable bases attract oxygen with very different degrees of force. This attraction is much influenced by temperature. Thus charcoal, which at ordinary temperatures seems to possess no attraction for oxygen, unites with it rapidly, and almost inseparably, when heated to ignition.

126. Oxygen combines with most oxygenizable substances in certain definite proportions, perhaps only in one, and the apparent variety of proportions may be owing to a second or third similar combination of the first compound with another quantity of oxygen, or of the base; and of the second compound with a third quantity.

127. The attraction between oxygen and the oxygenizable bases, is in the inverse ratio of saturation; or, in other words, the affinity by which they form their primary combinations, is stronger than that by which they form any secondary combination, and so on progressively.

128. In many instances, oxygenizement is so strongly opposed by cohesion, that it does not take place unless assisted by a degree of heat sufficient to melt or vaporize the oxygenizable base.

129. It is also often accompanied by the extrication of caloric and light in a very conspicuous degree. To these the term combustion should be confined; and only such oxygenizable bases as are capable of exhibiting these phenomena are combustible. These phenomena depend upon the new compound, having a weaker affinity or less capacity than its constituents for light and caloric, which are therefore extricated.

130. If the combustible body be vaporized, flame is produced, and the process is then denominated inflammation.

131. By its union with oxygenizable substances, oxygen undergoes very various changes of its properties. In many instances, the compounds of oxygen are fluid or solid, opaque, coloured, incapable of supporting inflammation, and deleterious to animal or vegetable life. The changes which the oxygenizable bases undergo, are no less conspicuous. Their form, colour, taste, odour, density, permeability to light and electricity, specific caloric, and, finally, their affinities, are often totally altered.

132. When, in consequence of oxygenizement, any substance acquires a sour taste, and the properties of converting vegetable blues to red, and of saturating or destroying the characteristic properties of alkalis and earths, it is said to be acidified, and such compounds are termed *Acids*.

133. When it does not acquire these properties, the compounds are termed *Oxides*.

134. Many oxides are capable of being converted into acids, by combination with an additional quantity of oxygen.

135. Oxygen is capable of combining at the same time with two or more substances; and the oxides or acids which result from such combinations, are termed Oxides or Acids with a double or triple base.

136. In general, the bases which are least simple, unite with oxygen in the greatest variety of proportions.

PRIMARY COMPOUNDS OF OXYGEN.

A. Binary,

a. with nitrogen :

1. Atmospheric air.
2. Nitrous oxide.
3. Nitric oxide.
4. Nitric acid.

b. With hydrogen : water.

c. With carbon :

1. Incombustible coal, plumbago.
2. Charcoal, (carbonous oxide).
3. Gaseous oxide of carbon, (carbonic oxide).
4. Carbonic acid.

d. With sulphur :

1. Protoxide of sulphur.
2. Peroxide of sulphur.
3. Sulphureous acid.
4. Sulphuric acid.

e. With phosphorus :

1. Oxide of phosphorus.
2. Phosphorous acid.
3. Phosphoric acid.

f. With metals :

1. Metallic oxides.
2. Metallic acids.

B. Ternary,

a. with carbon and hydrogen :

1. Oxides. Hydro-carbonous oxides, carburetted hydrogen gas, olefiant gas, alcohol, ether, oil, vegetable substances.

2. Acids. Vegetable acids.

b. with hydrogen and sulphur :

Sulphuretted hydrogen, hydroguretted sulphur.

C. Quaternary, with hydrogen, carbon and nitrogen.

1. Oxides. Animal substances.

2. Acids. Animal acids.

NITROGEN, (Azote).

137. *Nitrogen*, or *azotic*, gas constitutes 0.78 of the atmosphere. But as it has few attractions at ordinary temperatures, its principal effect on the chemical properties of the atmosphere seems to be the dilution of the oxygen gas, which in its pure state would be more active than is consistent with the economy of nature. It also is permanently elastic, compressible, inodorous, and insipid; it greens very delicate vegetable blues; its specific gravity is 0.0012; it is unable to support respiration, vegetation, or combustion; it is acidifiable, and is a constituent of the nitric and nitrous acids, nitrous and nitric oxides, of ammonia, and perhaps of the other alkalies, and of most animal substances; it dissolves phosphorus and carbon in small quantities, and is not absorbed by water.

PRIMARY COMPOUNDS OF NITROGEN.

A. Binary,

a. with oxygen:

1. Atmospheric air.
2. Nitrous oxide.
3. Nitric oxide: (Nitrous gas.)
4. Nitric acid.

b. With hydrogen. Ammonia. (Nitroguret of Hydrogen.)

c. With sulphur. Sulphuretted nitrogen gas.

d. With phosphorus. Phosphuretted nitrogen gas.

B. Quaternary, with hydrogen, carbon, and oxygen.

a. Oxides. Animal substances.

b. Acids. Animal acids.

138. *Atmospheric air* consists of 22 parts of oxygen gas, and of 78 of azotic gas by bulk, or 2+33, and 75.67 by weight; it is transparent, compressible, and permanently elastic; its specific gravity is 0.00123; it is inodorous and insipid, respirable and capable of supporting inflammation. The atmosphere besides the air now described, also contains other gases, vapour, &c.

139. *Nitrous oxide gas* is composed of 37 of oxygen, and 6 of nitrogen. It does not change vegetable colours; its specific gravity is 0.00197; it suffers no diminution when mixed with oxygen gas. Water absorbs about half its weight of it, at mean temperature. It does not combine directly with alkalies it supports combustion; and its respiration, when perfectly pure

or mixed with atmospheric air, produces the highest excitement the animal frame seems capable of undergoing.

140. *Nitric oxide gas* (nitrous gas) consists, according to Davy, of 44 nitrogen and 56 oxygen. It does not change vegetable colours. Its specific gravity is 0.001343. When mixed with about two-fifths of oxygen gas, they condense into red fumes, (nitrous acid), which are entirely absorbed by water. The quantity of oxygen gas that any air contains is sometimes estimated by the diminution of volume sustained after a sufficient quantity of nitrous gas has been mixed with it. Water absorbs 0.118 of its bulk of this gas. It is not inflammable; and only in very few instances supports combustion. It is noxious to vegetation, and its respiration is fatal to animals.

141. Nitrogen admits of higher degrees of oxygenizement, forming nitrous and nitric acids.

HYDROGEN.

142. *Hydrogen gas* is often found collected in mines and caverns. It is permanently elastic and compressible. Its specific gravity is 0.000094, being the lightest body with which we are acquainted. It is highly inflammable, and burns in contact with oxygen gas or atmospheric air, and detonates on the application of a burning body when mixed with them. It extinguishes flame, and is deleterious to animal life. It dissolves sulphur, phosphorus, and carbon, forming with them peculiar fetid gases.

PRIMARY COMPOUNDS OF HYDROGEN.

A. Binary,

- a. With oxygen; water.
- b. With nitrogen; ammonia.
- c. With sulphur; sulphuretted hydrogen.
- d. With phosphorus; phosphuretted hydrogen.

B. Ternary,

- a. With carbon and oxygen :
 1. Oxides; hydro carbonous oxides. Vegetable substances.
 2. Acids; Vegetable acids.
- b. With sulphur and oxygen; sulphuretted hydrogen.

C. Quaternary,

- With carbon, nitrogen, and oxygen :
1. Animal oxides.
 2. ——— acids.

143. Hydrogen, combined with oxygen, in the proportion of 14.42, to 85.58, forms water. Water is transparent, colourless, inodorous, and insipid. As water is assumed as the standard, or unity, in all tables of specific gravity, it is necessary to know that a cubic inch of it weighs, at 30 inches barometer, and 60° thermometer, 252.422 grains. At 32° it exists in a solid form, and is crystallized. At 212° it expands to 2000 times its bulk, and is converted into a very elastic vapour. It absorbs small quantities of the simple gases, especially oxygen. It dissolves several of the salifiable bases, and in some degree all saline bodies, and is essential to their crystallization. It is composed and decomposed in many instances, and its chemical agency is almost universal.

144. *Ammonia* (hydroguret of nitrogen) consists of 80 parts of nitrogen, with 20 of hydrogen. It exists in its purest form combined with caloric as a gas, which is perfectly transparent and colourless, elastic and compressible; specific gravity 0.000732; has a urinous and acrid odour, irritating the nostrils and eyes, and an acrid and caustic taste; does not dissolve animal substances; is irrespirable; extinguishes flame; colours vegetable blues green; and is decomposed by being transmitted through a red hot tube, and by the electric spark, into its constituent gases; and by oxygen and atmospheric air at a red heat, and by oxy-muriatic acid, it is converted into water and nitrogen gas. It is absorbed without change by porous bodies; it dissolves sulphur and phosphorus; and combines readily with water in all its states. Water is saturated by one-third of its weight of gaseous ammonia, and is thereby increased in bulk, and acquires the specific gravity of 0.905. Ammonia combines with all the acids, forming neutral salts. It is formed during the putrefactive fermentation; and is commonly classed with the alkalies. *Officinal.*

CARBON.

145. *Carbon*, in a state of perfect purity, is well known by the name of diamond. It possesses the highest degree of lustre, transparency, and hardness. It is crystallized, and generally colourless. Its specific gravity is from 3.44 to 3.55. It is insoluble in water, and can neither be melted nor vaporized by caloric. It is not acted upon by any chemical agent, except oxygen at very high temperatures. When exposed in oxygen gas to the rays of the sun, concentrated by a very powerful lens, its surface becomes sensibly blackened; it is ignited, and at last consumed. The result of this combustion is carbonic acid gas; 100 parts of which consist of 17.88 of carbon, and 82.12 of oxygen. It combines with iron, forming steel. It is a constituent of almost all animal and vegetable substances; and an oxide of carbon is obtained from them by exposing them to heat in closed vessels.

PRIMARY COMPOUNDS OF CARBON.

A. Binary,

a. With oxygen :

- | | |
|--|-----------|
| 1. Incombustible coal ; plumbago. | } oxides. |
| 2. Charcoal (carbonous oxide). | |
| 3. Gaseous oxide of carbon (carbonic oxide gas). | |
| 4. Carbonic acid. | |

b. With metals ; Metallic carburets.

B. Ternary, with oxygen and hydrogen :

1. Oxides.

- | | |
|------------------------|-------------|
| a. Hydro-carbonous. | b. Refins. |
| b. Alcohol. | i. Camphor. |
| c. Ether. | k. Starch. |
| d. Fixed oil and fats. | l. Sugar. |
| e. Wax. | m. Jelly. |
| f. Adipocere. | n. Tannin. |
| g. Volatile oils. | |

2. Acids.

- | | |
|--------------|---------------|
| a. Acetic. | b. Mucic. |
| b. Oxalic. | i. Benzoic. |
| c. Tartaric. | k. Succinic. |
| d. Citric. | l. Camphoric. |
| e. Malic. | m. Suberic. |
| f. Lactic. | n. Laccic. |
| g. Gallic. | o. Sebacic. |

C. Quaternary, with nitrogen, hydrogen, and carbon.

1. Oxides.

- | | |
|------------------------|----------------|
| a. Gum. | i. Indigo. |
| b. Tragacanth. | k. Lignin. |
| c. Extractive. | l. Suber. |
| d. Gum-refin. | m. Caoutchouc. |
| e. Bitter principle. | n. Gelatin. |
| f. Narcotic principle. | o. Albumen. |
| g. Acrid principle. | p. Fibrin. |
| h. Cinchonin. | q. Urea. |

2. Acids.

- | | |
|-------------|-----------|
| a. Prussic. | c. Amnic. |
| b. Uric. | |

146. *Plumbago* and *incombustible coal* contain carbon in the first degree of oxygenizement. The most remarkable known

property of this oxide, is the very high temperature necessary for its combustion.

147. Common *charcoal* of wood (carbonous oxide) is carbon in the second degree of oxygenizement, consisting of 63.86 of carbon, and 36.14 of oxygen. It is obtained in the form of solid masses of a black colour. It has neither smell nor taste. It is brittle and never crystallized. It absorbs light strongly, is perfectly refractory in the fire, insoluble in water, and a bad conductor of caloric, but an excellent one of electricity. At a red heat, it burns rapidly in oxygen gas, 28 of charcoal and 62 of oxygen forming 100 of carbonic acid gas. It also burns in atmospheric air, but less vividly. *Officinal.*

148. *Gaseous oxide of carbon* (carbonic oxide gas) is carbon in its third degree of oxygenizement. It is invisible and elastic; specific gravity 0.001167. It does not support combustion or respiration. With oxygen gas it burns with a lambent blue flame, and is converted entirely into carbonic acid, without producing any moisture. It has no affinity for lime. It consists of 25.99 carbon, and 74.11 oxygen; or 40.41 charcoal, and 59.59 oxygen.

SULPHUR.

149. *Sulphur* is a crystallizable solid; of a yellow colour; little sensible taste; particular smell; specific gravity 1.9907; brittle; electric; fusible at 234° ; burning with a pale blue flame at 302° ; and with a bright white flame at 570° ; and capable of combining with different proportions of oxygen. It is found pure in the neighbourhood of volcanoes, and exists in many minerals, and in animal substances. *Officinal.*

PRIMARY COMPOUNDS OF SULPHUR.

a. With oxygen:

1. Protoxide of sulphur.
2. Peroxide of sulphur.
3. Sulphureous acid.
4. Sulphuric acid.

b. With nitrogen. Sulphuretted nitrogen gas.

c. With hydrogen. Sulphuretted hydrogen.

d. With phosphorus. Sulphuretted phosphorus.

e. With salifiable bases. Earthy and alkaline sulphurets.

f. With metals. Metallic sulphurets.

150. *Oxide of Sulphur* is of a dark violet colour, and an austere taste, fracture fibrous, sp gr. 2.325; consistence tough. It contains 2.4 per cent. of oxygen. It is formed on the surface of melted sulphur.

151. *Peroxide of Sulphur* contains 6.2 per cent. of oxygen, and was procured by Dr Thomson, by passing a current of oxy-muriatic acid gas through flowers of sulphur. It is in this state that he supposes sulphur to exist in sulphuretted hydrogen gas, and the hydro-sulphurets.

152. *Sulphuretted Nitrogen Gas* is only known to have a fetid odour.

153. *Sulphuretted Hydrogen Gas* consists of 71 sulphur, and 29 hydrogen; specific gravity 0.000135. It has the odour of rotten eggs; is not respirable; burns with oxygen gas without exploding, and sulphur is deposited; is readily absorbed by water, and is the mode in which sulphur exists in mineral waters; reddens vegetable blues; and in its affinities, and the crystallizability of its compounds, it resembles the acids. *Officinal.* Hydro-sulphuret of ammonia.

154. *Hydroguretted Sulphur* is sulphuretted hydrogen combined with an additional dose of sulphur. It has the appearance of a yellow oil.

155. *Sulphurets* are solid opaque bodies, of considerable specific gravity, decomposable by heat, water, and the acids.

a. The alkaline and earthy sulphurets have a red or brownish red colour, and by solution in water are immediately converted into hydroguretted sulphurets. Sulphuret of potash is officinal.

b. The metallic sulphurets have neither taste nor smell, are often possessed of metallic brilliancy, and are conductors of electricity. *Officinal.* The Sulphurets of antimony, of mercury, of iron.

PHOSPHORUS.

156. *Phosphorus* is a semi-transparent solid, slightly brilliant, and of a waxy consistence; specific gravity 1.770; taste in some degree acrid and disagreeable; smell alliaceous. It is brittle under 32°; its fracture is vitreous, brilliant, and sometimes lamellated; above 32° it softens a little, becomes ductile about 90°, melts at 99°, becoming transparent like a white oil; at 180° begins to be vaporized, and at 54° boils. It is crystallizable into prismatic needles or long octohedrons. It exists in many minerals, and is obtained from bones and other animal substances.

PRIMARY COMPOUNDS OF PHOSPHORUS.

a. With oxygen:

1. Oxide of phosphorus.
2. Phosphorous acid.
3. Phosphoric acid.

- b. With nitrogen. Phosphuretted nitrogen gas.
- c. With hydrogen. Phosphuretted hydrogen gas.
- d. With sulphur. Phosphuret of sulphur.
- e. With metals. Metallic phosphurets.
- f. With salifiable bases. Alkaline and earthy phosphurets.

157. In its solid state, phosphorus is not acted upon by pure oxygen gas, but when melted, burns in it at 80° with a dazzling splendour, absorbing about half its weight of oxygen, and forming phosphoric acid. In atmospheric air, it undergoes a slow combustion at 43° , emitting light in the dark, but without the production of sensible heat; absorbing a portion of oxygen, and forming phosphorous acid; at 148° it burns rapidly, but less brilliantly than in oxygen gas, forming phosphoric acid. It is therefore always kept immersed in boiled water; but even there its surface is oxidized, becoming white and opaque.

158. *Hydrouretted phosphorus* possesses a peculiar odour, and the property of becoming luminous when mixed with oxygen gas. It may be combined with a much larger proportion of phosphorus, acquiring then a fetid alliaceous odour, a considerable increase of specific gravity, and the property of burning by the simple contact of oxygen, or of the atmosphere, with a very brilliant white flame.

159. *Sulphuretted phosphorus*, and phosphuretted sulphur, are of a yellowish colour, more fusible than either of the components, and exceedingly inflammable.

160. Nitrogen gas dissolves phosphorus, forming a fetid gas, which inflames at a low temperature.

161. Phosphuret of lime is insoluble in water; but when thrown into it, decomposes it, and produces phosphuretted hydrogen gas, whose bubbles catch fire when they burst on the surface of the water. Phosphuret of baryta is a brown mass; of a metallic appearance; very fusible; luminous in the dark, decomposed by exposure to air; emitting an alliaceous smell when moistened; and decomposed by water, furnishing phosphuretted hydrogen gas. The phosphuret of strontia is very similar.

METALS, AND METALLIC OXIDES.

162. Metals are crystallizable; their form depends on the regular tetrahedron or tube; their surface is specular; they are perfectly opaque, even when melted; their colour is various; their lustre peculiar and shining, or splendid; their hardness various, but at least considerable; many of them are brittle, others possess malleability and ductility in a surprising degree, and some are scissile, flexile, or elastic; their fracture in general is hackly; their

texture compact, fibrous or foliated; many of them are remarkably sonorous; their specific gravity greater than 5; they possess no smell or taste, unless when heated or rubbed; they are the best conductors of caloric and electricity; are powerful agents in producing the galvanic phenomena, and a few of them are the only substances which exhibit the phenomena of magnetism. By the action of caloric they are melted, but with different degrees of facility, and some of them may be vaporized. Except iron and platinum, they melt suddenly, without undergoing any intermediate state of softness; and when melted, their surface is convex and globular. They are insoluble in water, but some of them decompose it, and are oxidized by it.

PRIMARY COMPOUNDS OF THE METALS.

a. With oxygen :

1. Metallic oxides.

2. Acids of arsenic, tungsten, molybdenum, chrome, and columbium.

b. With hydrogen. Hydrogurets.

c. With carbon. Carburets.

d. With phosphorus. Phosphurets.

e. With sulphur. Sulphurets.

f. With each other. Alloys and amalgams.

163. They are oxidized with different degrees of facility, some by mere exposure to air, and others seem almost to resist the action of heat and air. Their oxidizability is always increased by increase of temperature. Their oxides are in the form of powder, laminæ, or friable fragments; sometimes crystalline; of various colours, determinate with regard to each metal; possess greater absolute weight; are refractory, or fusible into glass; insipid, or acrid, and styptic; in general insoluble in water; and combine either with acids and alkalies, or only with acids. Some of those are disoxygenized by light alone, others by caloric, and others require hydrogen, carbon, &c.

164. Most of them are capable of combining with different proportions of oxygen. Dr Thomson proposes to call the oxides with a minimum of oxygen Protoxides, and with additional doses Deutoxides, Tritoxides, &c. in succession, and the oxides with a maximum of oxygen Peroxides.

165. Hydrogen gas is capable of holding arsenic, zinc, and iron, in solution.

166. Carbon unites only with iron.

167. The metallic phosphurets are fusible, brilliant, brittle, granulated, lamellated, scarcely combustible, and permanent.

168. The sulphurets are brittle; crystallizable in large brilliant and metallic laminæ, more easily fusible than the refractory metals, but less easily than the very fusible metals; decomposable by heat, humidity, and the acids.

169. The mixtures of the metals with each other are termed Alloys: those in which mercury is contained are Amalgams. They acquire by mixture new properties, and are in general more fusible than their components. The reguline metals are not soluble in the acids; but when acted upon by them, are first oxidized, and then dissolved. The metallic oxides, by fusion, colour glasses and enamels.

OXIDIZABLE METALS.

170. *Gold* is of a brilliant yellow colour, insipid and inodorous; specific gravity between 19.258 and 19.300; soft and flexible; little elasticity or sonorousness; so ductile, that its surface may be extended more than 650,000 times; of very great tenacity; easily hammer-hardened; a good conductor of caloric, electricity, and galvanism; fusing at 32° of Wedgwood; brittle when cooled too quickly; crystallizing in octohedrons; unalterable in the air; converted, by a long and violent heat, into a vitrified, violet oxide; oxidized and dispersed by electricity; soluble in alkaline sulphurets; rendered brittle by phosphorus, arsenic, bismuth, tin, and antimony; less brittle by lead; soluble in mercury; hardened by zinc, copper, iron, steel, and silver; oxidizable, of a purple colour, and slightly soluble, in nitrous acid; very oxidizable, of a fawn or yellow colour by the nitro, or oxy-muriatic acids. Its oxide is easily reduced by light and heat; colours glasses purple or topaze-yellow, and forms a fulminating compound with ammonia.

171. *Platinum*. Of a grey, white colour, almost black when polished, insipid, inodorous; specific gravity 20.850 to 21.061; softer only than iron, and less ductile only than gold; most difficult of fusion, above 160° of Wedgwood; a good conductor of electricity and galvanism; unalterable by air and heat; converted into a grey powder, its first degree of oxidation, by electricity; unites with phosphorus; forms alloys with arsenic, bismuth, antimony, mercury, zinc, tin, lead, cast iron, copper, silver, and gold. It is oxidized and dissolved by the oxy muriatic acid, and more readily by the nitro-muriatic. Oxide grey.

172. *Silver*. Very brilliant, white, insipid, inodorous; specific gravity 10.474 to 11.091; hardness between iron and gold; elasticity between gold and copper; strong acute sound; considerable ductility and tenacity; hardening much under the hammer; a good conductor of electricity, caloric, and galvanism; fusible at 28° Wedgwood; crystallizable by cooling; unalterable in the air; changed into a greenish oxide by long and violent heat, burn-

ing with a greenish flame, and instantly by the electric shock. Its phosphuret is granulated, brittle and fusible; its sulphuret grey, black, lamellated, or striated and fusible; it unites but slightly with the acidifiable metals and iron; is hardened by gold, bismuth, antimony, tin, lead, and copper, and amalgamates with mercury. It is oxidized, and dissolved by the sulphuric, sulphurous, nitric, and oxy-muriatic acids. Its oxide is greenish; reducible by light and heat, hydrogen, and the other metals; colours some glasses of an olive green, and is very soluble in ammonia. *Officinal.*

173. *Copper.* Bright red; disagreeable taste and smell when rubbed or heated; sp. gr. 7.79; ductile; of great tenacity; sonorous; fusible at 27° Wedgwood; granulated texture, and subject to blisters; a good conductor of caloric, electricity and galvanism; becomes brown, and at last green in the air; when heated, turns blue, yellow, violet, deep brown; when ignited and plunged into water, forms brown, brittle scales of oxide. Its phosphuret is brilliant, brittle, hard, and fusible; its sulphuret brown, fusible, and very phosphoric; its alloy with arsenic is white, with bismuth reddish, with antimony violet, with mercury deep red, with zinc forms brass, and with tin is orange; it is oxidized and dissolved by the sulphuric, nitric and muriatic acids; its oxide is brown, brittle, and soluble in ammonia, producing a beautiful blue. *Officinal.*

174. *Iron* is of a bluish-grey colour; texture either fine grained, fibrous or dense plates; sapid and odorous; specific gravity 7.600; the hardest, most elastic and most tenacious metal; very ductile; fusing at 158° Wedgwood, fusion at first clammy, afterwards very fluid; igniting by strong percussion, and inflaming by the collision of flint; magnetic. It is oxidized slowly in the air, especially when moist; when heated in contact with air, it is changed to a black oxide, containing 0.20 to 0.27 of oxygen; fusible, hard, brittle, lamellated, still attracted by the magnet; afterwards into brown, red, fine pulverulent oxide, not attracted by the magnet, containing 0.40 to 0.49 of oxygen. It burns with splendour and deflagration in oxygen gas, and is converted into a fused, black oxide; it decomposes water slowly, and when ignited, very rapidly. In some instances it is dissolved in hydrogen gas. Carbon united to iron, converts it into steel. *Officinal.*

175. *Steel* is of a grey colour, brilliant and granular in its fracture; specific gravity 7.795; harder than any of the metals, and more elastic, ductile, malleable, and fusible at a lower temperature than pure iron. Its characteristic property is, that after being heated, if suddenly plunged into cold water, it becomes harder, more elastic, less pliable and brittle; but by being again heated and cooled slowly, it acquires its former softness, pliability and ductility. Steel contains only some hundredth parts of car-

bon, and is known chemically, by letting a drop of acid fall upon it, which produces a grey or black spot.

176. *Plumbago* consists of about 0.1 of iron, combined with carbon in its first degree of oxidizement. The phosphuret of iron is white, granulated, brittle, permanent in the air. Its sulphuret is yellow, hard, brittle, and very fusible, oxidizing slowly in a humid atmosphere. Iron forms alloys with arsenic, cobalt, manganese, bismuth, antimony, zinc, and tin. Iron is oxidized and dissolved by almost all the acids; oxides, black, brown, red. It gives glasses a brown, smoky, deep green, or black colour.

177. *Lead* is of a grey, blue, livid colour, streak grey, disagreeable taste and odour; specific gravity 11.352; soft; very laminable; hardens little under the hammer; very flexible; slightly tenacious; fusible at 612° Fahrenheit; volatile at a red heat; tarnished in the air; slightly oxidized by air and water; by heat and air it forms a grey, then a yellow, and lastly, a red oxide, which is vitrifiable. Its phosphuret and sulphuret are brittle; it forms alloys with arsenic, bismuth, antimony, mercury, zinc, and tin; it is oxidized by, and combines with, the sulphuric, nitric, muriatic, phosphoric, and other acids. Its oxide imparts to glass a uniform density, and strong refracting power. *Officinal.*

178. *Tin* is pure, brilliant, white, sapid, and odorous; specific gravity 7.291 to 7.500, soft, flexible, and emitting a crackling noise when bent; fusing at 442° Fahrenheit; oxidizes slowly in the air; is converted, when fused, into a grey oxide; when red hot it burns vividly. Its sulphuret and phosphuret are lamellated and brittle; it forms alloys with arsenic, bismuth, antimony, mercury, and zinc; it is oxidized by many acids, and combines with the muriatic, fluoric, boracic, and carbonic acids. Its oxide is grey or white, unites readily with sulphur, and renders glasses opaque. *Officinal.*

179. *Zinc* is bluish-white, lamellated, sapid, and odorous; specific gravity 7.190; laminable, soft, clogging the file; fusible at 700° ; vaporizable; a powerful agent in the phenomena of galvanism; oxidized by fusion; at a red heat it catches fire, and emits white films of oxide, which contain about 0.33 oxygen; it is soluble in hydrogen; it combines with phosphorus, sulphur, arsenic, antimony, and mercury; it easily decomposes water: it is oxidized and dissolved by almost all the acids. Oxide, white films. *Officinal.*

180. *Mercury*. Very bright white; specific gravity 13.568; freezing at -39 ; boiling at 660° , partly ductile and malleable; oxidizable by trituration in the air, and in a farther degree by the action of the air and heat; does not decompose water; forms amalgams with many metals; and is oxidized and dissolved by the sulphuric, nitric, and oxy-muriatic acids. Oxides, black, yellow, red. *Officinal.*

181. *Tellurium*. White, lead grey, very bright; harsh and brittle; lamellated; crystallizable; specific gravity 6.115; very fusible and volatile; burns with a blue and greenish flame, and a white smoke, having the odour of radish; oxide very fusible into a straw-coloured radiated glass; soluble in sulphuric, nitric, and nitro-muriatic acids; unites with sulphur. Oxides, black, white.

182. *Antimony*. White, very brilliant, lamellated; specific gravity 6.702; moderately hard; pulverizable; fusible at 809° ; volatile when highly ignited; sensible taste and smell; unalterable in cold air; oxidizable by air and heat; oxide fusible into a yellow brown glass; decomposes water when ignited; oxidized by the sulphuric, nitric, and muriatic acids; combines with phosphorus and sulphur. Oxides, black, brown, orange, yellow, white; and colour glass yellow or hyacinthine. *Officinal*.

183. *Bismuth*. White, slightly yellow, in large specular plates; pulverizable; specific gravity 9.822; moderately hard; sensible odour and taste, fusible at 460° , and volatile at a high temperature; oxidizable by heat and air; oxide vitrifiable into a greenish yellow glass; oxidizable by boiling sulphuric, nitric, and muriatic acids; unites with sulphur. Oxides grey, yellow, dirty green, and colour glass of a greenish yellow.

184. *Manganese*. Small whitish grey globules; specific gravity 6.850; very hard and very brittle; very difficult of fusion; very oxidizable by exposure to air; decomposes water strongly; is oxidized by the sulphuric, nitric, muriatic acids; combines with many metals. Oxides white, red, brown, and black; colour glass brown, violet, or red; discolour glass coloured by iron.

185. *Nickel*. Yellow or reddish white, granulated; specific gravity nearly 9.; said to be malleable in a state of purity; magnetic; very difficult of fusion, and of oxidization in the air; oxidizable by most of the acids, which it colours of a brilliant green; combines with phosphorus, sulphur, and the metals. Oxide light clear green, colouring glass brown, orange, red.

186. *Cobalt*. Reddish-grey, fine grained, pulverizable; specific gravity between 7.700 and 7.800; very difficult of fusion; oxidizable before fusion; unalterable by water; attacked by all the acids; combines with phosphorus and sulphur; its alloys are granulated, rigid, and brittle. Oxide deep blue or black, and colours glasses of a fine blue.

187. *Uranium*. An incoherent mass of small agglutinated globules, of a deep grey and pale brown; specific gravity 6.440; very hard; very difficult of fusion, even by long continued heat; is attacked by several of the acids; combines with phosphorus. Oxide soluble in the alkalies, and very soluble in their carbonates. Oxide yellow, colouring glass of a greenish yellow, emerald green, or various brown.

188. *Titanium*. Agglutinated, hard, friable masses, crystallized,

internally of a brilliant red; infusible; unalterable by water; oxidizable by boiling sulphuric, nitric, and muriatic acids. Oxides, blue, deep red, white.

ACIDIFIABLE METALS.

189. *Chromium*. Agglutinated masses of a whitish grey colour; very hard, very brittle, and very infusible; appears to be difficult to oxidize and easy to disoxidize; does not appear to decompose water; not attacked by the sulphuric or muriatic acids; changed into a green oxide, and afterwards into a red acid, by the nitric acid distilled from it. Oxide of a beautiful emerald green; acid a red or orange yellow powder.

190. *Molybdenum*. In black powder, or agglutinated, blackish, friable masses, having little metallic brilliancy; specific gravity 6; by a strong heat changes into a white brilliant oxide in needles, and very acidifiable; oxidizable by boiling sulphuric acid, and acidifiable by the nitric acid. It forms a sulphuret; and its alloys are granulated and friable; acid white, pulverulent, styptic, specific gravity 8.400.

191. *Tungsten*. Small slightly adherent globules of a slate grey; specific gravity 17.5; very infusible; oxidizable in the air by heat, and afterwards acidifiable. Oxide yellow, pulverulent, colouring glass of a blue or brown colour; and a white harsh powder; specific gravity 6.12.

192. *Arsenic*. Grey plates of a lively brightness; friable; specific gravity between 8.310 and 5.703; vaporizable at 540° ; emitting a smell like garlic; crystallizable; oxidizable in the cold air; inflammable at a red heat, and sublimed in the form of the white oxide or acid; farther oxidizable by the nitric and nitrous acids; combines with phosphorus, sulphur, and many of the metals; soluble in hydrogen gas. *Officinal*.

193. *Columbium* has hitherto been examined only in the state of columbic acid, which is a white powder insoluble in water.

Besides these, several other metals have been lately discovered but their properties are too imperfectly understood, and they are too rare to render a description of them necessary in this place.

ACIDS with SIMPLE BASES, and their COMPOUNDS.

194. The simple substances, in their extreme states of oxygenization, constitute a strongly marked class of bodies termed *Acids*, which are distinguished by the following properties:

- a. Their taste is sour;
- b. They change vegetable blues to red;
- c. They combine with water in almost any proportion, without suffering any change in their properties, except when depend on dilution.

d. They unite with alkalies, earths, metallic oxides; forming compounds with them, possessed of new properties, and commonly known by the names of Neutral and Metallic Salts.

195. Besides some of the metals, hydrogen is the only simple substance which does not seem to be capable of acidification; and, on the other hand, there are three acids, the muriatic, boracic, and fluoric, with whose composition we are still unacquainted.

196. *Carbonic acid gas* is transparent, colourless, without smell, irrespirable, and incapable of supporting inflammation; its specific gravity is 0.0018. Water absorbs an equal bulk of it at 41° , acquiring a specific gravity of 1.0015, and an agreeable acidity and sparkling appearance, especially if heated to 88° . It is separated from water by freezing or boiling. It is also absorbed by alcohol, oil of turpentine, and olive oil. It contains 17.88 carbon, and 82.12 oxygen, or 28 charcoal, and 72 oxygen. Its compounds are denominated Carbonates. *Officinal.*

197. The *carbonates* always preserve their alkaline properties in some slight degree. They are decomposed by all the acids, forming a brisk effervescence, which is colourless. The carbonates of the metals very much resemble their oxides. *Officinal.* Carbonates of baryta, of lime, of magnesia, of potash, of soda, of ammonia, of zinc, and of iron.

198. *Nitrous acid* is of a brown or red colour, exceedingly volatile and emitting an intolerable and suffocating odour. By the addition of water, its colour is successively changed to blue, green, and yellow. In the state of vapour, it is absorbed by water, oil, and sulphuric acid. It consists of about 70 parts of oxygen, and 30 of nitrogen, or rather of nitric acid and nitric oxide. It forms Nitrites. *Officinal.*

199. The *nitrites* are characterized by their emitting the nitrous acid in orange fumes, on the addition of sulphuric acid.

200. *Nitric acid* consists of nitrogen combined with oxygen. It is liquid, colourless, and transparent. It is very corrosive, and tinges the skin of a yellow colour. It has a strong affinity for water, and absorbs it from the atmosphere. When most concentrated, its specific gravity is 1.504. It produces heat when mixed with water. It is decomposed by many substances. Light converts it in part into nitrous acid. When entirely deprived of water, it sets fire to oils, to sulphuretted hydrogen gas, to iron filings, when perfectly dry; and to zinc, bismuth, and tin, when poured on them in a state of fusion. It oxygenizes all the metals, except gold, platinum, and titanium. It consists of 70.50 by weight, of oxygen, and 29.50 of nitrogen. *Officinal.*

201. The *nitrates*, by the action of fire, furnish impure oxygen gas, mixed with nitrogen, and are reduced to their basis. By the action of concentrated sulphuric acid, they admit a white vapour,

and they are capable of supporting combustion. *Officinal.* Nitrates of potash, and of silver.

202. *Sulphurous acid gas* is colourless, incapable of maintaining combustion, and deleterious when respired. It has a strong suffocating odour; its specific gravity is 0.00246, or 0.00251. Water at 54° rapidly absorbs one-fourth of its weight of this gas, and when saturated, acquires the specific gravity of 1.040. It is again expelled from it by heat, but not by freezing. It is also absorbed by sulphuric acid, to which it imparts the property of crystallizing, forming what is called Glacial sulphuric acid; oils and ether. When water is present, it is converted by oxygen gas into sulphuric acid. It is decomposed by hydrogen, carbon, and sulphuretted hydrogen gas, when assisted by heat. It oxidizes iron, zinc, and manganese. It consists of 85 sulphur, and 15 oxygen.

203. The *sulphites*, by the action of heat, furnish sulphur, and become sulphates. They are also converted into sulphates, with effervescence, and exhalation of sulphurous vapours, by the sulphuric, nitric, muriatic, and other acids, and gradually, by exposure to the atmosphere when dry, and very quickly when dissolved. *Officinal.* Sulphate of potash with sulphur.

204. *Sulphuric acid* is also composed of sulphur and oxygen. It may be obtained in a crystallized or glacial form, but generally exists as a dense liquid; specific gravity 1.85; slightly viscid; transparent and colourless; without smell; of a strong acid taste. At 36° it freezes; it boils at 590° . It has a strong attraction for water, absorbing it rapidly from the atmosphere, and producing considerable heat when mixed with it. It is decomposed by most inflammable substances. It does not oxidize gold, platinum, tungsten, or titanium. It decomposes the alkaline and earthy sulphurets, and reduces all organic substances to charcoal. In medicine it is a powerful refrigerant and antiseptic. It contains 56 sulphur, and 44 oxygen. *Officinal.*

205. The *sulphates* form sulphurets, when heated to redness with charcoal, and furnish copious precipitates with solutions of baryta. *Officinal.* Sulphates of baryta, potash, soda, zinc, copper, iron, mercury.

206. *Phosphorous acid* is a white fluid of an oily appearance. It has a fetid odour, and disagreeable taste; and gives out a thick white smoke and vivid flame when strongly heated. It is decomposed by ignited charcoal. The proportions of phosphorus and oxygen have not been ascertained.

207. The *phosphites* are fusible, and when heated in close vessels furnish a little phosphorus, and become phosphates. When heated in the open air, they emit a phosphorescent light, and often flashes of flame, accompanied by a strong smell of garlic, and a thick white vapour, and are converted into phosphates.

208. *Phosphoric acid* is composed of phosphorous acid and oxy-

gen. It is crystallizable, fusible, and vitrescent. Its specific gravity is 2.687. It readily attracts moisture from the atmosphere, and then its specific gravity becomes 1.417. Its mixture with water produces little increase of temperature. It is decomposed at a high temperature by hydrogen and carbon, and by several of the metals. It consists of 40 phosphorus and 60 oxygen.

209. The *phosphates* are crystallizable, fixed, fusible, vitrifiable, and phosphorescent. They are not decomposed by charcoal. They are soluble in nitric acid without effervescence, and precipitable from that solution by lime water. *Officinal.* Phosphate of soda.

METALLIC ACIDS AND THEIR COMPOUNDS.

210. *Arsenious acid* is of a white colour; has a sharp acrid taste, and an alliaceous smell; specific gravity 3.706; is soluble in 80 times its weight of water at 60°, and in 15 at 212°. At 283° it sublimes; if heated in close vessels is vitrified, and its specific gravity becomes 5.000. It consists of 75 of arsenic, and 25 of oxygen, and is a most virulent poison. *Officinal.*

211. The *arsenites* are scarcely known; but their acid is driven off by heat, and is precipitated by all the acids.

212. *Arsenic acid* consists of arsenious acid and oxygen. It is not crystallizable; has an acid caustic taste, and is not volatile, but very fixed and vitrifiable. Its specific gravity is 3.391. It attracts moisture from the atmosphere, and is soluble in two-thirds of its weight of water. By a red heat it loses part of its oxygen, and becomes arsenious acid. It consists of 8 parts of arsenious acid, and 1 of oxygen, or of 65 arsenic, and 35 oxygen.

213. The *arsenites* are decomposed by charcoal at a high temperature.

214. *Tungstic acid* is a white powder of a rough, metallic, and feebly acid taste. Its specific gravity is 3.600. It is soluble at 212° in twenty waters. Exposed to heat it becomes yellow, brown, and lastly black; emits no smoke, and is not fused; but loses its solubility in water. The sulphuric acid changes its colour to blue, and the nitric and muriatic acids to a fine yellow.

215. The *tungstates* are little known.

216. *Molybdic acid* is a white powder of an acid but metallic taste. Its specific gravity is 3.4. It is not altered in the air. It is melted, and is fixed, in a covered crucible; but when the cover is removed, it sublimes in a white smoke, which condenses in brilliant yellow scales. It dissolves at 212° in 960 waters. By heat it forms a blue solution in sulphuric acid. It is also soluble in the muriatic, but not in the nitric acid.

217. The *molybdates* are scarcely known.

218. *Chromic acid* is a red or yellow orange powder, of a par-

ticular, rough, metallic taste. It is soluble in water, and may be obtained in ruby-coloured crystals. It is decomposable by heat and light, passing to the state of green oxide. It is reduced by heat and charcoal. It oxygenizes the muriatic acid.

219. The *chromates* are of a yellow or orange colour.

220. *Columbic acid* is a white powder, which reddens litmus paper, although it seems insoluble in water. It is soluble in boiling sulphuric and muriatic acids, but not in the nitric. It is precipitated from its solutions by water, potash, and soda. With prussiate of potash it forms an olive green precipitate, and with tincture of galls, a deep orange precipitate. It combines with potash and soda, and expels carbonic acid. It does not unite with ammonia.

221. *Columbate* of potash resembles boracic acid in its appearance.

222. Other metallic oxides seem capable of acidification; but our information respecting them is not yet sufficient to enable us to enumerate their properties.

UNDECOMPOSED ACIDS AND THEIR COMPOUNDS.

223. *Muriatic acid gas* is transparent and colourless. It destroys life and extinguishes flame. Its specific gravity is 0.002315. Water is capable of dissolving about an equal weight of it. Its specific gravity is then 1.500; it is generally of a pale yellow colour; is very volatile, and emits white fumes of a peculiar unpleasant odour. The gas decomposes alcohol and oil, and destroys putrid exhalations. It is further oxygenized by the nitric acid. *Official.* Muriatic acid.

224. The *muriates* have a more or less pure salt taste. They are not acted upon by any combustible body. They are all soluble in water, and are the most volatile and most difficultly decomposed by heat of the neutral salts. They emit white fumes with the sulphuric acid, and oxy-muriatic acid gas with the nitric. *Official.* Muriates of soda, ammonia, baryta, lime, mercury, antimony.

225. *Oxygenized muriatic acid* (or, by contraction, oxy-muriatic acid) gas is composed of muriatic acid 84 and oxygen 16. It is of a yellow colour, very pungent smell, and acrid taste. It supports flame, but is deleterious when respired. It destroys the vegetable colours. It oxygenizes alloxygenizable substances, and repasses to the state of muriatic acid. It is decomposed by light. It does not unite readily with water. Water when saturated with it weighs 1.003.

226. The *oxy-muriates* have lately had their existence rendered doubtful by Mr Chenevix.

227. *Hyper-oxygenized muriatic acid* consists of muriatic acid 35, and oxygen 65. It has not been obtained in a separate state.

228. *Hyper-oxymuriates* give out very pure oxygen gas by the action of caloric, and become muriates. Their acid is expelled from them with noise, by the stronger acids; and they inflame combustible bodies, even spontaneously, and with detonation.

229. *Fluoric acid gas* is invisible, irrespirable, and extinguishes flame. It has a pungent smell, approaching to that of muriatic acid. It is heavier than common air. It corrodes the skin. It is absorbed by water. Its most remarkable property is that of dissolving silica. Its composition is unknown.

230. *Fluates* afford, when treated with concentrated sulphuric acid, a vapour which corrodes glass, and from which the silica is afterwards precipitated by water.

231. *Boracic acid* exists in the form of small, shining, laminated crystals. Specific gravity is 1.479. It is fixed and vitrifiable in the fire. It is soluble in fifty parts of boiling water. It is also soluble in alcohol, to which it imparts the property of burning with a yellow flame. It oxidizes only iron and zinc.

232. *Borates* are vitrifiable; and their concentrated solutions afford, when heated with the strong sulphuric acid, brilliant, lamellated crystals. *Officinal.* Sub-borate of soda.

OF COMPOUND OXIDES AND ACIDS.

233. We have already noticed all the binary combinations which oxygenizable substances form with oxygen. These in general have considerable permanence in their characters, and admit of few variations in the proportions of their constituent principles. But oxygen is capable of entering into combination at the same time with more than one of these simple oxygenizable substances, forming oxides and acids, with double or triple bases, which, in consequence of the increased number of principles, are subject to greater variations in the proportion of these, and are less permanent in their characters. These are, however, the substances in which pharmacy is chiefly engaged, as they comprehend the whole of the vegetable and animal kingdoms. Chemists, borrowing their arrangement from natural history, have almost always considered them under the title of Vegetable and of Animal Substances. But such an arrangement is so totally unconnected with the principles of chemistry, that the imperfect state of our knowledge is the only apology that can be offered for its continuance; and imperfect as that knowledge is, we are persuaded, that even a very imperfect attempt, at a chemical classification of these bodies, is to be preferred.

COMPOUND OXIDES.

234. The compound oxides are characterized by their great alterability, and by their affording, when burnt with a sufficient quantity of oxygen, both water and carbonic acid. They may be divided into

- a. Ternary oxides, containing various proportions of carbon, hydrogen, and oxygen.
- b. Quaternary oxides, consisting of nitrogen, carbon, hydrogen, and oxygen.

235. The ternary oxides coincide nearly with the class of vegetable substances, and are characterized

- a. By their being converted entirely into water and carbonic acid gas, when completely decomposed by oxygen.
- b. By their undergoing the acid fermentation, from the action of air and water.
- c. And by their furnishing nitrous gas and carbonic acid, when treated with nitric acid.

236. The quaternary oxides coincide nearly with animal substances, and are characterized

- a. By their furnishing, when decomposed by oxygen, ammonia as well as water and carbonic acid gas.
- b. By their becoming putrid from the action of air and water.
- c. And by their furnishing nitrogen gas when treated with nitric acid.

TERNARY OXIDES.

237. The ternary oxides may be subdivided into gaseous, fluid, or easily fusible, and solid infusible. In general the gaseous and volatile compound oxides, contain the largest proportion of hydrogen, and the infusible dense oxides the largest proportion of carbon.

238. *Hydro-carbonous oxides* (hydro-carbonates) are invisible elastic gases of a strong disagreeable smell, irrespirable and incapable of supporting combustion, insoluble in water, burning with oxygen with a blue lambent flame, and producing carbonic acid gas and water. From their furnishing charcoal, when decomposed by melted sulphur, and from the products of their combustion, they evidently contain oxygen. There are different species of hydro-carbonates depending on the proportion of their constituents, which, from their specific gravities, are commonly distinguished into heavy and light hydro-carbonates.

239. The light hydro-carbonous oxides are obtained by the distillation of wet charcoal, or by transmitting the vapours of alcohol through an ignited tube : specific gravity 0.00059 to 0.00064. The heavy hydro-carbonous oxides are obtained, by distillation from camphor, ether, animal and vegetable substances, and by collecting the gas of marshes : specific gravity 0.00080 to 0.00082. The latter contain more carbon, require more oxygen for their decomposition, and furnish a larger proportion of carbonic acid gas, and less water than the former.

240. *Alcohol* is a transparent colourless liquid, of an agreeable penetrating smell, and pungent burning taste : specific gravity 0.8. It remains fluid in the greatest natural or artificial cold. It boils at 176° , and in vacuum at 56° . Alcohol unites with water in every proportion. During the combination, caloric is evolved, and the specific gravity of the compound is greater than the mean of those of the components. Alcohol dissolves about 60 of sulphur, when they are presented to each other in a state of vapour. It also dissolves a little phosphorus. These solutions are decomposed by water. It dissolves the boracic and carbonic acids, ammonia, soda, and potash, and is the means employed to obtain the two last in a state of purity. Its action on the salts is various. It dissolves the volatile oils, resins, soaps, balsams, camphor, sugar, tannin, cinchonin, extractive, and in part the gummy resins. Alcohol is very inflammable, and when kindled it burns entirely away with a blue flame without smoke. The products of its combustion are carbonic acid and water. It is also decomposed by being transmitted in the state of vapour through a red-hot porcelain tube ; by being heated with the fixed alkalies ; and by the action of the sulphuric, nitric, oxy-muriatic, and acetic acids. From Lavoisier's experiment on the combustion of alcohol, it was found by calculation to consist of 51.72 oxygen, 29.88 charcoal, and 18.40 hydrogen ; but by correcting the calculation according to Morveau's experiments, proving the composition of charcoal, from the same experiment alcohol would seem to consist of 65.05 oxygen, 18.22 carbon, and 16.73 hydrogen. *Officinal.*

241. *Ether* is a transparent colourless fluid, of a very fragrant odour, and hot pungent taste : specific gravity 0.758. It freezes and crystallizes at -46° . It boils at 98° , and in vacuum at -20° . It is very soluble in air, and during its evaporation it produces an intense degree of cold. It is soluble in ten parts of water, and in alcohol in every proportion. It dissolves a small portion of phosphorus, and the solution is decomposed by alcohol. It absorbs nitrous gas, combines with ammonia, and dissolves the volatile oils, resins, and caoutchouc. Ether is extremely inflammable, and burns with a white flame. Its vapour explodes when kindled in contact with oxygen gas. It is decomposed by sulphuric acid, oxy-muriatic acid gas, and by being transmitted through a red-

hot porcelain tube. Its constituents are oxygen, carbon, and hydrogen, the proportions not ascertained. *Officinal.*

242. *Fixed oils* are transparent, more or less coloured, somewhat viscid, inodorous fluids, having a mild taste and unctuous feel. In the different species the specific gravity varies from 0.9403 to 0.9153. The point of congelation also differs considerably, but in general it is within the range of the ordinary temperatures of the atmosphere. Their boiling point exceeds 600° , and by being converted into vapour, they become empyreumatic. Fixed oils do not seem capable of combining with charcoal, but are freed from impurities, by being filtered through hot charcoal. When assisted by heat, they dissolve sulphur and phosphorus. They may be blended with sugar and gum by trituration as in emulsions, and they dissolve the volatile oils, and resins, and gummy resins. With the alkalies and earths they form soaps, and with metallic oxides plasters. They are not soluble in water or in alcohol. They unite readily with oxygen, which renders them concrete. Those oils which dry without losing their transparency, as linseed oil, are termed drying oils, in contradistinction to the fat oils which from exposure become white, opaque, and thick, and remain greasy, such as oil of olives or of almonds. When they become rancid, they undergo a farther degree of decomposition, and are found to contain sebatic acid. Oil in the state of vapour is inflammable, and burns with a white flame. When the combustion is complete, the products are carbonic acid gas and water, but in general soot is deposited. The sulphuric acid renders the fixed oils brown and thick, and converts them into water and charcoal. The nitric acid oxygenizes them. The oxygenized muriatic acid blanches them, and renders them concrete like tallow or wax. The oils oxidize several of the metals, and are oxidized by several of their oxides. From Lavoisier's experiment on the combustion of olive oil, its constituent principles were estimated at 79 charcoal and 21 hydrogen; but by correction they appear to be 50.39 carbon, 20.23 hydrogen, and 29.38 oxygen. *Officinal.* Oil of almonds, linseed, olives, mustard, castor oil, and cocoa butter.

243. *Fat and tallow* scarcely differ from the fixed oils, except in being more concrete and more disposed to rancidity. Fat melts between 92° and 127° . Tallow is still less fusible. They cannot be converted into vapour without suffering decomposition; and, when melted, leave, like oil, a greasy stain on paper. *Officinal.* Mutton suet, axunge.

244. *Wax* is a solid, of considerable consistence, granulated and crystalline in its fracture, of a white colour, and without any remarkable odour or taste. It softens and becomes plastic when very slightly heated; at 142° it melts; at a higher temperature it is in part vaporized and decomposed, and its vapour is inflam-

mable. It resists in a remarkable degree the action of the acids; but in most of its other properties it resembles the fixed oils. From its combustion it appears to consist of carbon 53.12, hydrogen 16.91, and oxygen 29.97; or, according to the former calculation, of 82.28 charcoal, and 17.72 hydrogen. *Officinal.*

245. *Spermaceti* may be obtained crystallized in white argentine plates, of an unctuous feel and taste, and a vapid smell. It melts between 90° and 95° , and at a higher temperature may be sublimed almost unchanged. Its vapour is inflammable, and its flame is bright, clear, and without smell. By exposure to air it becomes rancid. It is soluble, especially by the assistance of heat, in alcohol and in ether. In its other properties it agrees with the fixed oils, with which it unites very readily by fusion. Muscular flesh by long maceration in water is converted into a substance very analogous to spermaceti, but more fusible, melting at 82° ; and biliary calculi often consist of another, which is much less fusible, requiring a heat of 192° for its fusion. For all these varieties, Fourcroy has proposed the generic name *Adipocere*. *Officinal.* Spermaceti.

246. *Soaps* are combinations of the fluid or concrete fixed oils with alkalies, earths, or metallic oxides. The alkaline soaps have an unpleasant taste and peculiar smell, form a milky solution with water, and a transparent one with alcohol, and are powerfully detergent. White soap is made of soda and olive oil or tallow. Brown soap contains also resin. Soft soap consists of potash and whale oil: The white spots in it are from the addition of a little tallow. The volatile liniment of the pharmacopœias is a soap of ammonia and olive oil. The alkaline soaps are decomposed by all the earthy salts. The alkali of the soap combines with the acid of the salts, and an earthy soap is formed from the union of the earth and oil. The earthy soaps are insoluble in water. The alkaline soaps are decomposed in the same way by the metallic salts. The metallic soaps are also insoluble in water: many of them are soluble in oil, and some of them in alcohol. *Officinal.* Soaps of soda and ammonia.

247. *Plasters* are also combinations of oil with metallic oxides. They are prepared by their immediate action on each other. Olive oil and litharge are most commonly employed. *Officinal.* Litharge plaster.

248. *Volatile oils* differ from the fixed oils most remarkably in being vaporized unchanged by a heat under 212° ; by evaporating completely without leaving a stain on paper; by being sapid, often pungent and odorous; and by being soluble in alcohol, and to a certain degree in water. They are more inflammable than the fixed oils, and burn with a large white flame, emit a great deal of smoke, and require more oxygen for their combustion. By exposure to air they become coloured and thick, and are at

last converted into an almost inodorous resin. They are also oxidized and converted into resins by muriate of mercury, and muriate of antimony; the acids act on them with great violence, and are even capable of inflaming them. On the other hand, they resist considerably the action of the alkalies. In their other general properties they agree with the fixed oils, from which they seem to differ in composition, only in containing a larger proportion of hydrogen. In other respects, these oils are infinitely varied, especially in their taste and odour. Some are as limpid as water, others are viscid, others congeal on a slight diminution of temperature, and are even naturally concrete, and others are capable of forming crystallizations. Their predominant colours are the different shades of yellow and red, but there are also blue, green, and glaucous essential oils. Their specific gravity varies from 0.8697 to 1.0439. *Officinal.* Oil of anise, cajeput, caraway, fennel, juniper, lavender, mace, origanum, pennyroyal, peppermint, pimento, rosemary, rue, saffrafras, savin, spearmint, turpentine, cloves, and all aromatic or odorous substances. *Empyreumatic oils*, oil of amber, of hartshorn, of petroleum.

249. *Resins* are concrete substances, possessing a certain degree of transparency, and are generally of an amber or brownish-red colour. Their texture is homogeneous, and their fracture vitreous. They are easily reduced to powder, which readily agglutinates. Their specific gravity varies from 1.0452 to 1.2289. They have little taste or smell. They are electrics. Exposed to a certain degree of heat, they melt without suffering alteration, but they are decomposed when converted into vapour. Their vapour is inflammable, and burns with a large strong flame and a great deal of soot. Resins unite by fusion with sulphur, difficultly with phosphorus. They are soluble in alcohol, the fixed and the volatile oils, and alkalies, and in nitric acid with evolution of nitric oxide gas. They are insoluble in water, and are not acted upon by metallic oxides. *Officinal.* Pine resins, dragons blood, guaiac, balsams of Peru, Tolu, Gilead, and Canada, turpentine, benzoin, storax, olibanum, tacamahac, mastiche, sandarac, elemi.

Amber, copal, and about one-fifth of sandarac, differ from the resins in not being soluble in alcohol without particular management.

250. *Camphor* is a concrete friable substance, of a white colour, with a considerable degree of transparency, and a crystalline appearance, specific gravity 0.9887. Its taste is bitter and acrid, and its smell penetrating and peculiar. It is evaporated unchanged by a heat of 145° , but may be melted by suddenly exposing it to 302° . The vapour when condensed crystallizes in hexagonal plates. Its vapour is exceedingly inflammable, and when kindled it burns with a very white flame and a great deal of smoke, and leaves no residuum. The products of its combustion are carbonic acid gas, charcoal, and water. Camphor is soluble

in alcohol and in the acids. From these solutions it is precipitated by water. It is also soluble in hot oils, both volatile and fixed, but on cooling separates from them in plumose crystals. It is insoluble in water, and is not acted on by the alkalies, metals or metallic oxides. By repeated distillation with nitric acid, it is converted into a peculiar acid. It exists in many vegetables, but is chiefly procured from the *laurus camphora*. *Official.*

251. *Starch* is a fine white powder, generally concreted in friable hexagonal columns, smooth to the feel, and emitting a particular sound when compressed. It has neither taste nor smell. It is decomposed by heat. It is not soluble in cold water nor in alcohol. Warm water converts it into a kind of paste, which on cooling assumes a gelatinous form. This jelly when dried by heat becomes transparent and brittle like gum, but is not soluble in cold water. Starch, after being thus dissolved in hot water, cannot be reduced to its original state. It is precipitated by infusion of galls, and the precipitate is soluble in boiling water, but not in alcohol. *Official.* Wheat, starch, flour, barley, oats.

252. *Sugar* is a hard, but brittle substance, of a white colour, disposed to form semi-transparent crystallizations, of a sweet taste, and without smell. When heated sufficiently it melts, is decomposed, emits a peculiar smell (caramel), and becomes inflamed. Sugar at 40° is soluble in its own weight of water, and in still less at 212° . It is also soluble in about four parts of boiling alcohol. It combines with volatile oils, and renders them miscible with water. It also unites with potash and lime. It is decomposed by the concentrated sulphuric and nitric acids. According to Lavoisier's experiments, it consists of 71.76 oxygen, 17.89 carbon, and 10.35 hydrogen; or, according to the original calculation, of 64 oxygen, 28 charcoal, and 8 hydrogen. *Official.* Sugar, honey, manna. Substances containing sugar, liquorice, sarcocoll, logwood, figs, raisins, currants, cassia fistula, prunes.

253. *Jelly* is contained in the juices of acid fruits. It is deposited from them in the form of a soft tremulous mass, almost colourless, and agreeable to the taste. It is scarcely soluble in cold water, but very soluble in hot water; and when the solution cools, it again assumes a gelatinous form. With sugar its combination is well known. By long boiling it loses this property of congealing. When dried, it becomes transparent, hard, and brittle, resembling gum. It combines with the alkalies, and is converted by the nitric acid into oxalic acid. *Official.* Acidulous fruits.

254. *Tannin*, when completely dried, is a brittle substance, of a black colour, and vitreous fracture; it is soluble in alcohol; it is much more soluble in hot than in cold water. The solution has a dark-brown colour, astringent taste, and peculiar smell; it is precipitated by acids, in the form of a viscid fluid, like pitch;

it is also precipitated by carbonate of potash in yellow flakes; it forms an insoluble elastic precipitate with gelatin, and dark blue or black precipitates with iron. Mr Hatchett has lately prepared a species of tannin artificially, by the action of nitrous acid on charcoal. *Officinal.* Galls, uva ursi, tormentil, rhubarb, sarsaparilla, St Lucie cinchona, swietenia, simarouba, filix mas, kino, catechu, salix.

QUATERNARY OXIDES.

255. *Gum*, when pure, is transparent and colourless, easily reduced to powder; without smell, and of a slightly sweetish taste. It is very soluble in water, and its solution is glutinous. The solution of gum in water constitutes mucilage; it is thick and adhesive, and soon dries when exposed to the air. Gum is also soluble in the weak acids; but is totally insoluble in alcohol, which even precipitates it from mucilage. When triturated with a small quantity of oil or resin, it renders them miscible with water. Gum is very little disposed to spontaneous decomposition: even mucilage may be kept for many years without change; but it is decomposed by the strong acids. By oxygenizement with nitric acid, it forms successively mucous, malic, and oxalic acid; with oxy-muriatic acid it forms citric acid. When exposed to heat, it does not melt, but softens, swells, and becomes charred and incinerated. Its products are carbonic acid, and carburetted hydrogen gas, empyreumatic oil, and a considerable quantity of acetous acid, combined with a little ammonia. Fourcroy and Vauquelin say it consists of 65.38 oxygen, 23.08 carbon, and 11.54 hydrogen. Cruickshanks has however demonstrated, that it contains nitrogen and lime, and has rendered it probable that it differs from sugar in containing more carbon and less oxygen. *Officinal.* Gum Arabic, linseed, quinceseed.

256. *Tragacanth* is opaque and white, difficultly pulverizable, not sweetish, very sparingly soluble in water, but absorbing and forming a paste with a large quantity. Its solution is adhesive, but cannot be drawn out into threads. It moulds readily, and acquires a fetid smell. It is precipitated by nitrate of mercury. It is insoluble in alcohol, and seems to contain more nitrogen and lime than gum does. *Officinal.* Tragacanth.

257. *Extractive* is soluble in water, especially when hot, and in alcohol; it is also soluble in the weak acids, but is insoluble in ether. It attracts moisture from the atmosphere; and when dissolved in water, it absorbs oxygen, and becomes insoluble in water; it is also altered and precipitated by oxy-muriatic acid; it has a strong affinity for alumina, and decomposes several metallic salts. It is found in almost all plants, but can scarcely be

procured separate, so that its characters are not well ascertained.

Officinal. Saffron, aloes.

258. *Gum-resins*, in strict propriety, should not be noticed here, as they are secondary compounds, and probably vary much in their nature. They seem to be compounds of resin with extractive and essential oil, and perhaps other immediate principles, not yet ascertained. *Officinal.* Gum ammoniac, galbanum, scammony, assafoetida, gamboge, myrrh, sagapenum, olibanum.

259. *Bitter principle*, (Thomson), intensely bitter, of a yellowish colour, ductile while soft, brittle while dry, not fusible, soluble in alcohol and in water, not crystallizable, precipitated by nitrate of silver, acetate of lead. *Officinal.* Quassia, gentian, colocynth, broom, simarouba, dandelion, colomba, marsh trefoil, lesser centaury, blessed thistle, different species of artemisia, cinchona jamaicensis.

260. *Narcotic principle*. crystallizable, soluble in about 400 parts of boiling water, soluble in cold water, soluble in 24 parts of boiling alcohol, soluble in hot ether, in all acids, and in hot volatile oils, fusible, not volatile, highly narcotic. *Officinal.* Opium, lactuca, belladonna, hyosciamus, hemlock, stramonium.

261. *Acrid principle*, soluble in alcohol, water, acids and alkalies, rises in distillation with water and alcohol, volatile, not neutralized by alkalies or acids. *Officinal.* Squills, garlic, colchicum, asarum, arum, hellebore, bryony, iris, ranunculus, digitalis, viola, scurvygrass, mustard.

262. *Cinchonin*, not acrid, soluble in alcohol and in water, precipitated by infusion of galls; precipitate soluble in alcohol. *Officinal.* Cinchona officinalis, colomba, angustura, ipecacuan, piper, opium, capficum.

263. *Indigo* has a deep blue colour, is light and friable, without taste or smell, insoluble in water, alcohol, ether, and oils, forming a deep blue solution with sulphuric acid when precipitated from acids; soluble in alkalies, becoming green. It is obtained from the indigofera tinctoria, and isatis tinctoria.

264. *Caoutchouc*, when smoke has not been employed in drying it, is of a white colour, soft, pliable, extremely elastic, and difficultly torn; specific gravity 0.9335; inalterable by exposure to air; insoluble in water, but softened, so that its edges may be made to adhere to each other; insoluble in alcohol; soluble, without alteration, in ether washed with water, and in rectified petroleum; soluble in volatile oils; and fusible by heat, but altered, so that it remains glutinous after evaporation and cooling; inflammable; insoluble in alkalies, and decomposed by the strong acids. Its decomposition proves that it consists of carbon, hydrogen, nitrogen, and oxygen. It is obtained principally from *Hevea caoutchouc* and *Jatropha elastica* in South America, and the Fi-

cus Indica, *Artocarpus integrifolia*, and *Urceola elastica* in the East Indies.

265. *Suber* constitutes the epidermis of all vegetables. On the quercus *suber* it is thickened by art in a surprising degree, and forms common cork. It is a light elastic substance, very inflammable, burning with a bright white flame, and leaving a very spongy charcoal; it is not soluble in any menstruum; it is decomposed by nitric acid, and is converted into a peculiar acid, and an unctuous substance.

266. *Wood*, (Lignin?) when separated from all the other matters with which it is combined in vegetables, is a pulverulent, fibrous, or lamellated body, more or less coloured, of considerable weight, without taste or smell, and insoluble in water or alcohol. When exposed to sufficient heat, it is decomposed without melting or swelling, and is converted into charcoal without any change of form. Its products, by combustion, are carbonic acid, and carburetted hydrogen gas, water, empyreumatic oil, and acetous acid. By nitric acid, it is changed into the malic, oxalic, and acetous acids. It forms, as it were, the skeleton of all vegetables.

267. *Gelatin*, when exsiccated, is a hard, elastic, semi-transparent substance, resembling horn, having a vitreous fracture: inalterable in the air, soluble in boiling water, and forming with it a gelatinous mass on cooling; it is also soluble, but less readily, in cold water. It is soluble in acids, even when much diluted, and also in the alkalies. It is precipitated by tannin, with which it forms a thick, yellow precipitate, soon concreting into an adhesive, elastic mass, readily drying in the air, and forming a brittle substance, of a resinous appearance, exactly resembling overtanned leather; very soluble in ammonia, and soluble in boiling water. It is also precipitated copiously by carbonate of potash, and by alcohol; both precipitates being soluble in water. The solution of gelatin in water, first becomes acid, and afterwards putrid. When decomposed by nitric acid or heat, its products shew that it contains only a small proportion of nitrogen. It is principally contained in the cellular, membranous, and tendinous parts of animals, and forms an important article of nourishment. Glue and isinglass, which are much employed in the arts, are almost pure gelatin. *Officinal.* Isinglass, cornu cervi.

268. *Albumen* is a brittle, transparent substance, of a pale yellow colour, and glutinous taste, without smell, readily soluble in cold water, insoluble in boiling water, but softened and rendered opaque and white when thrown into it; insoluble, and retaining its transparency in alcohol; swelling; becoming brown, and decrepitating when suddenly exposed to heat. It generally exists in the form of a viscid, transparent fluid, having little taste or smell, and readily

soluble in cold water. When exposed to a temperature of 165° , it coagulates into a white opaque mass, of considerable consistency; it is also coagulated by alcohol and acids, and remarkably by muriate of mercury. Albumen forms with tannin a yellow precipitate, insoluble in water. *Coagulated albumen* is not soluble either in cold or in boiling water. It is soluble, but with decomposition, in the alkalies and alkaline earths. It is also soluble in the acids, greatly diluted, but may be precipitated from them by tannin. When slowly dried, it becomes brittle, transparent and of a yellow colour, resembling amber. When decomposed by nitric acid or heat, it is found to contain more nitrogen than gelatin does. White of egg consists of albumen, combined with a very little soda, sulphur, and phosphate of lime. Albumen also forms a large proportion of the serum of the blood, and is found in the sap of vegetables. It is highly nutritious. *Officinal.* White of egg.

269. *Fibrin* is of a white colour, without taste or smell, tough and elastic, but when dried, hard and almost brittle. It is not soluble in water or in alcohol. The concentrated caustic alkalies form with it a kind of fluid viscid soap. It is dissolved even by the weak and diluted acids; but it undergoes some change, by which it acquires the properties of jellying, and being soluble in hot water. By maceration in water, it becomes putrid, and is converted into adipocere. By long boiling in water, it is rendered tough and corneous. When decomposed by heat or nitric acid, it is found to contain a large proportion of nitrogen. It forms the basis of the muscular fibre, and is contained in small quantity in the blood. The gluten of wheat does not seem to differ from it in any important property. It is eminently nutritious.

270. *Urea* is obtained in the form of brilliant micaceous crystals, in groups, forming a mass of a yellowish white colour, adhering to the vessel containing it; difficult to cut or break; hard and granulated in its centre, gradually becoming soft, and of the consistency of honey on its surface; of a strong, disgusting, alliaceous odour; of an acrid, pungent, disagreeable taste. It is deliquescent; its solution causes a sensible diminution of temperature; it is also soluble in alcohol, especially when assisted by heat. On cooling, the alcoholic solution deposits crystals of pure urea. By the application of heat, it melts, swells rapidly, and at the same time begins to be decomposed, emitting an insupportably fetid odour, and is converted into carbonate of ammonia, and carburetted hydrogen gas. Urea is charred by concentrated sulphuric acid; diluted sulphuric acid aided by heat, is capable of converting it entirely into acetous acid and ammonia; concentrated nitrous acid decomposes it with rapidity; diluted nitric acid, aided by heat, changes it almost entirely into carbonic acid gas and nitrogen gas; mu-

riatic acid dissolves and preserves it; oxy-muriatic acid converts it into ammonia and carbonic acid; potash aided by heat, converts it into the carbonate and acetate of ammonia. It influences the form of the crystallization of the muriates of ammonia and soda. The solution of urea in water varies in colour from a deep brown to pale yellow, according to its quantity. With eight parts of water it is perfectly fluid; it scarcely undergoes spontaneous decomposition when pure, but the addition of some albumen occasions it to putrefy rapidly. By repeated distillation it is completely converted into carbonate of ammonia. With nitric acid it forms a pearly crystalline precipitate; it also forms precipitates with the nitrates of lead, mercury, and silver. It is not precipitated by tannin or gallic acid. Urea is only obtained from urine by evaporating the solution of a thick extract of urine in alcohol.

COMPOUND ACIDS.

271. The compound acids possess the properties of acids in general; but they are distinguished from the acids with simple bases, by their great alterability.

272. The ternary acids coincide nearly with the vegetable acids, and are characterized by their being converted entirely into water and carbonic acid when completely decomposed by oxygen. They consist of various proportions of carbon, hydrogen, and oxygen.

273. The quaternary acids coincide nearly with the animal acids; and are characterized by their furnishing ammonia as well as water and carbonic acid when decomposed.

TERNARY ACIDS.

274. *Acetic acid* is a transparent and colourless fluid, of an extremely pungent smell and a caustic acid taste, capable of reddening and blistering the skin. It is very volatile, and its vapour is highly inflammable; it combines with water in every proportion; it combines with sugar, mucilage, volatile oils, alcohol; it dissolves boracic acid, and absorbs carbonic acid gas; it is formed by the acidification of sugar, and by the decomposition of some other ternary and quaternary compounds by heat or acids. It is decomposed by the sulphuric and nitric acids, and by heat. The proportions of its constituents are not ascertained. In its ordinary state, it has only an acid taste, a pleasant odour, specific gravity 1.0005, congeals and crystallizes at -22° , and is vaporized at 212° . *Official.*

275. *Acetates* are very soluble in water; are decomposed by heat, by exposure of their solutions to the air, and by the stronger acids. *Official.* Acetate of potash, lead, mercury.

276. *Oxalic acid* is obtained in quadrangular crystals, transparent and colourless, of a very acid taste. They are soluble in their own weight of water at 212° , and in about two waters at 65° . Boiling alcohol dissolves somewhat more than half its weight, and at an ordinary temperature a little more than one-third. It is soluble in the muriatic and acetic acids. It is decomposed by heat, sulphuric acid, and nitric acid. According to Fourcroy, it consists of 77 oxygen, 13 carbon, and 10 hydrogen.

277. *Oxalates* are decomposed by heat; form a white precipitate with lime-water, which is soluble in acetic acid, after being exposed to a red heat. The earthy oxalates are very sparingly soluble in water; the alkaline oxalates are capable of combining with excess of acid, and become less soluble.

278. *Tartaric acid* varies in the forms of its crystals; its specific gravity is 1.5962; it is permanent in the air; it is decomposed by heat; it dissolves readily in water, and the solution is not decomposed by exposure, unless very dilute; it may be changed by nitric acid into oxalic acid. According to Fourcroy, it consists of 70.5 oxygen, 19.0 carbon, and 10.5 hydrogen. *Officinal.* Exists in tamarinds, grapes, &c.

279. *Tartrates*, by a red heat, are converted into carbonates. The earthy tartrates are scarcely soluble in water: the alkaline tartrates are soluble; but when combined with excess of acid, they become much less soluble. The tartaric acid is capable of combining at the same time with two bases. When tartrates are digested in sulphuric acid, the tartaric acid is separated, and is recognized by forming a gritty precipitate with a solution of potash. *Officinal.* Super-tartrate of potash, tartrate of potash and soda.

280. *Citric acid* crystallizes in rhomboidal prisms, which suffer no change from exposure to the air, and have an exceedingly acid taste. When sufficiently heated, they melt, swell, and emit fumes, and are partly sublimed unchanged, and partly decomposed. Water, at ordinary temperatures, dissolves $\frac{1}{4}$ of its weight of these crystals; at 212° twice its weight. The solution undergoes spontaneous decomposition very slowly. Sulphuric acid chars it, and forms vinegar. Nitric acid converts it into oxalic and acetic acids. *Officinal.* Orange and lemon juice, lemons, &c.

281. *Citrates* are decomposed by the stronger mineral acids, and also by the oxalic and tartaric, which form an insoluble precipitate in their solutions. The alkaline citrates are decomposed by a solution of barytes.

282. *Malic acid* is a viscid fluid, incapable of crystallization, of a reddish-brown colour, and very acid taste. It exists in the juice

of apples, and combined with lime in that of the common house-leek. It forms precipitates in the solution of the nitrates of mercury, lead, and silver. *Officinal.* Barberry, plumb, sloe, elder, &c.

285. *Malates* having alkalies for their base, are deliquescent. The acidulous malate of lime is soluble in cold water.

286. *Gallic acid* crystallizes in brilliant colourless plates, of an acid and somewhat austere taste, and of a peculiar odour when heated. It may be sublimed without alteration, although a strong heat decomposes it in part. It is not altered by exposure to the air, is soluble in $1\frac{1}{2}$ of water at 212° , and in 12 waters at 60° , and in four times its weight of alcohol. It has a strong affinity for metallic oxides, especially iron. It precipitates gold, copper, and silver brown, mercury orange, iron black, bismuth yellow, and lead white. *Officinal.* It exists in nut galls, and in most astringent vegetable substances.

287. *Gallates* have not been examined.

288. *Mucic acid* is a white gritty powder, of a slightly acid taste, soluble in 80 times its weight of boiling water.

289. *Mucates* of potash and soda are crystallizable. *Mucates* with earthy and metallic bases are nearly insoluble.

290. *Benzoic acid* crystallizes in compressed prisms of a pungent taste and aromatic smell. It is fusible, and evaporates by heat, for the most part, without change. When brought in contact with flame, it catches fire, and leaves no residuum. It is permanent in the air. It is very sparingly soluble in cold water; but at 212° it dissolves in about 24 waters. It is also soluble in hot acetic acid. It is soluble, without change, in alcohol, in concentrated sulphuric and nitric acids, and is separated from them by water. *Officinal.* In balsam of Tolu, of Peru, benzoin, storax, &c.

291. *Benzoates*, little known, but generally forming feather-shaped crystals, and soluble in water.

292. *Succinic acid* crystallizes in transparent white triangular prisms; may be melted and sublimed, but suffers partial decomposition; more soluble in hot than in cold water; soluble in hot alcohol. *Officinal.*

293. *Succinates* little known.

294. *Camphoric acid* crystallizes in white parallelopipeds of a slightly acid bitter taste, and smell of saffron, efflorescing in the air; sparingly soluble in cold water; more soluble in hot water; soluble in alcohol, the mineral acids, volatile and unctuous oils; melting and subliming by heat.

295. *Camphorates* have commonly a bitter taste, burn with a

blue flame before the blowpipe, and are decomposed by heat, the acid subliming.

296. *Suberic acid* is not crystallizable, but is obtained either in the form of thin pellicles, or of a powder. At 60° it requires 140 times its weight of water for its solution; at 212° only twice its weight. When heated, it first melts, then becomes pulverulent, and at last sublimes. It changes the blue colour of a solution of indigo in sulphuric acid, of the nitrate of copper, and of the sulphate of copper to green, and gives a yellow colour to the green sulphate of iron, and to the sulphate of zinc.

297. *Suberates* have in general a bitter taste, and are decomposed by heat.

298. *Laccic acid* is obtained in the form of a reddish liquor, having a slightly bitter saltish taste, and the smell of new bread, by expression from the white lac of Madras; but on evaporation it assumes the form of acicular crystals. It rises in distillation. It decomposes with effervescence the carbonates of lime and soda. It renders the nitrate and muriate of barytes turbid. It assumes a green colour with lime water, and a purplish colour with sulphate of iron; and precipitates sulphuret of lime white, tincture of galls green, acetite of lead reddish, nitrate of mercury whitish, and tartrate of potash in the same way as tartarous acid does, except that the precipitate is not soluble in potash.

299. *Laccate* of lime bitterish, of soda deliquescent.

300. *Sebacic acid* has no smell, and a slightly acid taste. It is crystallizable, melts like fat, and is not volatile. It is so soluble in hot water as to become solid on refrigeration. It is also very soluble in alcohol. It precipitates the nitrates of lead, silver, and mercury, and the acetates of lead and mercury. It does not precipitate the waters of lime, baryta, or strontia.

301. *Sebates* are soluble salts.

QUATERNARY ACIDS.

302. *Prussic acid* is a colourless fluid, of a strong smell, like that of peach flowers or bitter almonds, and a sweetish pungent taste. It does not redden vegetable blues, and unites difficultly with the alkalies and earths. It is easily decomposed by light, heat, or oxygenized muriatic acid. It does not act upon the metals, but forms coloured and generally insoluble combinations with their oxides. It has a great tendency to form triple salts with alkaline and metallic bases. It is obtained from animal substances by the action of heat, nitric acid, fixed alkalies, and putrefaction. *Officinal.* Bitter almonds. *Prunus lauro-cerasus.*

303. *Prussiates* of alkalies are easily decomposed even by carbo-

nic acid. They form variously-coloured precipitates in the solutions of the metallic salts, except those of platinum.

304. *Amnic acid* is obtained in white, brilliant, acicular crystals, of an acid taste, reddening the tincture of turnsol, sparingly soluble in cold water, but somewhat more soluble in hot water. It is soluble in alcohol. It is decomposed by heat.

305. *Amnates*. Very soluble in water, and the acid is precipitated from them in the form of a white crystalline powder, by the other acids.

306. *Uric acid* is obtained in the form of acicular brilliant crystals, of a pale yellow colour, almost insoluble in cold, and very sparingly soluble in boiling water, but becoming very soluble when combined with an excess of potash or soda. It is decomposed at a high temperature, and furnishes carbonate of ammonia, and carbonic acid, with very little oil or water, and leaves a charcoal which contains neither lime nor alkali. It is also decomposed by the nitric and oxygenized muriatic acids.

307. The *urates* are almost insoluble in water. The sub-urates of soda and potash are very soluble, and the uric acid is precipitated from their solutions even by the carbonic acid.

CHARACTERS OF SALTS DERIVED FROM THEIR BASES.

CLASS FIRST. *Alkaline salts*. Soluble in water, not precipitated by potash or oxalic acid.

GENUS I. *Potash*. Sapid, bitter, crystallizable, fusible, calcinable, vitrified or reduced to their base by heat, decomposed in general by baryta, rarely by lime. *Official*. Sulphate, nitrate, carbonate, super-tartrate, tartrate, acetate.

G. II. *Soda*. Sapid, bitter, crystallizable, commonly containing much water of crystallization, and therefore efflorescent, and undergoing the watery fusion and exsiccation before they are melted by the fire, decomposed by baryta and potash. *Official*. Sulphate, muriate, phosphate, carbonate, tartrate, sub-borate.

G. III. *Ammonia*. Sapid, acrid, very soluble, either sublimed unchanged, or decomposed, losing their base partially or totally by heat, base also expelled by baryta, potash, soda, strontia, and lime. *Official*. Muriate, carbonate, acetate.

CLASS SECOND. *Earthy salts*. Either insoluble in water, or if soluble, precipitated by sulphuric acid, and carbonate of potash.

G. I. *Baryta*. Generally insoluble in water, and indecomposable by fire, all poisonous and decomposed by the alkaline carbonates. *Official*. Sulphate, carbonate, and muriate.

G. II. *Strontia*. Generally insoluble in water, and indecompos-

able by fire, not poisonous, and decomposed by the alkaline carbonates, potasfs, soda, and baryta.

G. III. *Lime*. Generally sparingly soluble in water, decomposed by the alkaline carbonates, potasfs, soda, baryta, and strontia, and by oxalic acid. *Officinal*. Carbonate, muriate, phosphate.

G. IV. *Magnesia*. Generally soluble in water, and bitter, decomposed by baryta, potasfs, soda, strontia, and partially by ammonia. Magnesian salts, when added to ammoniacal salts, containing the same acid, quickly deposite crystals of a triple ammoniaco-magnesian salt. *Officinal*. Sulphate, carbonate.

G. V. *Glucina*. Taste sweetish, decomposed by all the preceding bases; when recently precipitated by an alkali, soluble in carbonate of ammonia, precipitated by an infusion of nut-galls, and succinate of potasfs.

G. VI. *Alumina*. Generally soluble in water, taste sweetish, and styptic, decomposed by all the preceding bases; when recently precipitated soluble in the alkalies, and in sulphuric acid, precipitated by hydro-sulphuret of potasfs. *Officinal*. Super-sulphate.

G. VII. *Yttria*. Sweetish styptic taste, decomposed by all the preceding bases, precipitated by prussiate of potasfs and iron, and by infusion of galls.

G. VIII. *Zirconia*. Taste austere, decomposed by all the preceding bases, precipitate not soluble in the alkalies, and when redissolved in muriatic acid, precipitated by hydro-sulphuret of potasfs, prussiate of potasfs and iron, and infusion of galls.

G. IX. *Silica*. Forms only one salt with fluoric acid, which is crystallizable, soluble in excess of acid, and in the alkaline fluates.

CLASS THIRD. *Metalline salts*.

1. Soluble in water, precipitated by hydro-sulphuret of potasfs.

2. Insoluble in water, fusible with borax into a coloured glass, or with charcoal into a metallic button.

G. I. *Gold*. Soluble in water, solution yellow, metal precipitated by sulphate of iron, sulphurous acid and infusion of galls, prussiate of potasfs and iron gives a yellowish white and muriate of tin a purplish precipitate.

G. II. *Platinum*. Solution in water brownish, not precipitated by prussiate of potasfs and iron, or infusion of galls, coloured bright red by muriate of tin, metal precipitated by sulphuretted hydrogen, precipitated orange by prussiate of mercury, and in small red crystals by potasfs and ammonia.

G. III. *Silver*. Metal precipitated by copper and sulphate of iron. Precipitated white by muriatic acid and the prussiates, black by hydro-sulphuret of potasfs, and yellowish brown by infusion of galls. *Officinal*. Nitrate.

G. IV. *Copper*. Soluble in water; solution blue or green, ren-

dered bright blue by ammonia, metal precipitated by iron, precipitated black by hydro-sulphuret of potass, greenish yellow by prussiate of potass and iron, and brown by oxalic acid. *Officinal.* Sulphate.

G. V. *Iron*. Soluble in water. Solution green or brownish red; precipitated blue by the triple prussiates, and purple or black by infusion of galls. *Officinal.* Sulphate, tartrate, acetate, carbonate.

G. VI. *Lead*. Insoluble salts easily reduced. Soluble salts colourless; precipitated white by triple prussiate, infusion of galls and zinc, and black by hydro-sulphuret of potass. *Officinal.* Acetate, sub-acetate.

G. VII. *Tin*. Soluble, not precipitated by infusion of galls; precipitated white by triple prussiate and lead, black by hydro-sulphuret of potass, and brown by sulphuretted hydrogen.

G. VIII. *Zinc*. Soluble; colourless; not precipitated by any metal or infusion of galls; precipitated white by alkalies, triple prussiate, hydro-sulphuret of potass, and sulphuretted hydrogen. *Officinal.* Sulphate.

G. IX. *Mercury*. Volatile; precipitate by copper metallic by triple prussiate and muriatic acid, white, by hydro-sulphuret of potass, black, and by infusion of galls orange. *Officinal.* Muriate, sub-muriate, sub-sulphate.

G. X. *Tellurium*. Not precipitated by triple prussiate. Precipitate by zinc black and metallic, by hydro-sulphuret of potass brown, by infusion of galls yellow, and by alkalies white, and soluble when the alkali is added in excess.

G. XI. *Antimony*. Precipitate by iron or zinc black, by hydro-sulphuret of potass orange. *Officinal.* Muriate, phosphate, tartrate.

G. XII. *Bismuth*. Solution colourless. Precipitate by copper metallic, by water and triple prussiate white, by infusion of galls orange, and by hydro-sulphurets black.

G. XIII. *Manganese*. Soluble, not precipitated by gallic acid. Precipitate by alkalies, triple prussiate and hydro-sulphurets white.

G. XIV. *Nickel*. Salts soluble; colour green; precipitate by triple prussiate dull green, by hydro-sulphuret black, by infusion of galls greyish white, and by iron, &c. metallic.

G. XV. *Cobalt*. Soluble, reddish, precipitate by alkalies blue or reddish brown, by triple prussiate brown with a shade of blue.

G. XVI. *Uranium*. Soluble, yellow, precipitate by alkalies yellow, by alkaline carbonates white, soluble in excess of alkali by triple prussiate brownish red, by hydro-sulphuret of potass brownish yellow, and by infusion of galls chocolate.

G. XVII. *Titanium*. Precipitate by alkaline carbonates flake white, by triple prussiate and hydro-sulphuret green, and by infusion of galls reddish brown, solution coloured red by tin, and blue by zinc.

G. XVIII. *Chromum*. Precipitate by triple prussiate and hydro-sulphuret green, and by infusion of galls brown.

G. XIX. *Molybdenum*. Solutions blue, precipitate by triple prussiate and tincture of galls brown.

G. XX. *Tungsten*. Unknown.

G. XXI. *Arsenic*. Precipitate by water and triple prussiate white, by hydro-sulphuret of potash yellow.

G. XXII. *Columbium*. Colourless; precipitate by alkaline carbonates and zinc white, by triple prussiate green, by hydro-sulphuret of ammonia chocolate, and by tincture of galls orange.

SECT. II.

PHARMACEUTICAL OPERATIONS.

COLLECTION AND PRESERVATION OF SIMPLES.

308. **E**ACH of the kingdoms of nature furnishes articles which are employed in medicine, either in their natural state, or after they have been prepared by the art of pharmacy.

309. In collecting these, attention must be paid to select such as are most sound and perfect, to separate from them whatever is injured or decayed, and to free them from all foreign matters adhering to them.

310. Those precautions must be taken which are best fitted for preserving them. They must in general be defended from the effects of moisture, too great heat or cold, and confined air.

311. When their activity depends on volatile principles, they must be preserved from the contact of the air as much as possible.

312. As the vegetable kingdom presents us with the greatest number of simples, and the substances belonging to it are the least constant in their properties, and most subject to decay, it becomes necessary to give a few general rules for their collection and preservation.

313. Vegetable matters should be collected in the countries where they are indigenous; and those which grow wild, in dry soils and high situations, fully exposed to the air and sun, are in

general to be preferred to those which are cultivated, or which grow in moist, low, shady, or confined places.

314. Roots which are annual, should be collected before they shoot out their stalks or flowers; biennial roots in the harvest of the first, or spring of the second year; perennial roots either in spring before the sap has begun to mount, or in harvest, after it has returned.

315. Those which are worm-eaten, except some resinous roots, or which are decayed, are to be rejected. The others are immediately to be cleaned with a brush and cold water, letting them lie in it as short time as possible; and the fibres and little roots, when not essential, are to be cut away.

316. Roots which consist principally of fibres, and have but a small tap, may be immediately dried. If they be juicy, and not aromatic, this may be done by heat, not exceeding 100° of Fahrenheit; but if aromatic, by simply exposing them, and frequently turning them in a current of cold, dry, air: if very thick and strong, they are to be split or cut into slices, and strung upon threads; if covered with a tough bark, they may be peeled fresh, and then dried. Farinaceous roots are to be dipped in boiling water, before they are dried. Such as lose their virtues by drying, or are directed to be preserved in a fresh state, are to be kept buried in dry sand.

317. No very general rule can be given for the collection of herbs and leaves, some of them acquiring activity from their age, and others, as the mucilaginous leaves, from the same cause, losing the property for which they are officinal. Aromatics are to be collected after the flower-buds are formed; annuals, not aromatic, when they are about to flower, or when in flower; biennials, before they shoot; and perennials, before they flower, especially if their fibres become woody.

318. They are to be gathered in dry weather, after the dew is off them, or in the evening before it falls, and are to be freed from decayed, withered, or foreign leaves. They are usually tied in bundles, and hung up in a shady, warm, and airy place; or spread upon the floor, and frequently turned. If very juicy, they are laid upon a sieve, and dried by a gentle degree of artificial warmth.

319. Sprouts are collected before the buds open; and stalks are gathered in autumn.

320. Barks and woods are collected when the most active parts of the vegetables are concentrated in them, which happens in spring and in autumn. Spring is preferred for resinous barks, and autumn for the others which are not resinous, but rather gummy. Barks should be taken from young trees, and freed from decayed parts, and all impurities.

321. The same rules direct the collection of woods; but they

must not be taken from very young trees. Among the resinous woods, the heaviest, which sink in water, are selected. The alburnum is to be rejected.

322. Flowers are collected in clear dry weather, before noon, but after the dew is off: either when they are just about to open, or immediately after they have opened. Of some the petals only are preserved, and the colourless claws are even cut away; of others whose calyx is odorous, the whole flower is kept. Flowers which are too small to be pulled singly, are dried with part of the stalk: These are called heads or tops.

323. Flowers are to be dried nearly as leaves, but more quickly, and with more attention. As they must not be exposed to the sun, it is best done by a slight degree of artificial warmth, and in some cases they should be put up in paper bags. When they loose their colour and smell they are unfit for use.

324. Seeds and fruits, unless when otherwise directed, are to be gathered when ripe, but before they fall spontaneously. The emulsive and farinaceous seeds, are to be dried in an airy, cool place: the mucilaginous seeds by the heat of a stove. Some pulpy fruits are freed from their core and seeds, strung upon thread, and dried artificially, by exposing them repeatedly to the heat of a stove. They are in general best preserved in their natural coverings, although some, as the colocynth, are peeled, and others, as the tamarind, preserved fresh. Many of these are apt to spoil, or become rancid; and as they are then no longer fit for medical use, no very large quantity of them should be collected at a time.

325. The proper drying of vegetable substances is of the greatest importance. It is often directed to be done in the shade, and slowly, that the volatile and active particles may not be dissipated by too great heat; but this is an error, for they always loose infinitely more by slow than by quick drying. When, on account of the colour, they cannot be exposed to the sun, and the warmth of the atmosphere is insufficient, they should be dried by an artificial warmth, less than 100° Fahrenheit, and exposed to a free current of air. When perfectly dry and friable, they have little smell; but after being kept some time, they attract moisture from the air, and regain their proper odour.

326. The boxes and drawers in which vegetable matters are kept, should not impart to them any smell or taste; and more certainly to avoid this, they should be lined with paper. Such as are volatile, of a delicate texture, or subject to suffer from insects, must be kept in well covered glasses. Fruits and oily seeds, which are apt to become rancid, must be kept in a cool, and dry, but by no means in a warm, or moist place.

327. Oily seeds, odorous plants, and those containing volatile principles, must be collected fresh every year. Others, whose

properties are more permanent, and not subject to decay, will keep for several years.

328. Vegetables collected in a moist and rainy season, are in general more watery and apt to spoil. In a dry season, on the contrary, they contain more oily and resinous particles, and keep much better.

MECHANICAL OPERATIONS OF PHARMACY.

- a. The determination of the weight and bulk of bodies.
- b. The division of bodies into more minute particles.
- c. The separation of their integrant parts by mechanical means.
- d. Their mixture, when not attended by any chemical action.

329. The quantities of substances employed in pharmaceutical operations, are most accurately determined by the process called weighing. For this purpose, there should be sets of beams and scales of different sizes; and it would be advisable to have a double set, one for ordinary use, and another for occasions when greater accuracy is necessary. A good beam should remain in equilibrium without the scales, and when the scales are changed; and it should turn sensibly with a very small proportion of the weight with which it is loaded. Balances should be defended as much as possible from acid and other corrosive vapours, and should not be left suspended longer than is necessary, as it impairs their delicacy very much. For the same reason, balances should never be overloaded.

330. The want of uniformity of weights and measures is attended with many inconveniencies. In this country, druggists and grocers sell by avoirdupois weight; and the apothecaries are directed to sell by troy weight, although, in fact, they seldom use the troy weight for more than two drachms. Hence arise numerous and culpable errors, the troy pound being less than the avoirdupois, and the ounce and drachm being greater. Comparative tables of the value of the troy, avoirdupois, and new French decimal weight, are given in the appendix.

331. The errors arising from the promiscuous use of weights and measures, have induced the Edinburgh and Dublin colleges to reject the use of measures entirely, and to direct that the quantities of every thing fluid, as well as solid, shall be determined by troy weight: But as the London college have given their sanction to the use of measures, and as, from the much greater facility of their employment, apothecaries will always use them, tables of measures are also inserted in the appendix.

332. For measuring fluids, the graduated glass measures are always to be preferred: They should be of different sizes, according to the quantities they are intended to measure. Elastic fluids are also measured in glass tubes, graduated by inches and their decimals.

333. Specific gravity is the weight of a determinate bulk of any body. As a standard of comparison, distilled water has been assumed as unity. The specific gravity of solids is ascertained, by comparing the weight of the body in the air with its weight when suspended in water. The quotient obtained by dividing its weight in air, by the difference between its weight in air and its weight in water, is its specific gravity. The specific gravity of fluids may be ascertained by comparing the weight of a solid body, such as a piece of crystal, when immersed in distilled water, with its weight when immersed in the fluid we wish to examine; by dividing its loss of weight in the fluid by its loss of weight in the water, the quotient is the specific gravity of the fluid: Or a small phial, containing a known weight of distilled water, may be filled with the fluid to be examined and weighed, and by dividing the weight of the fluid by the weight of the water, the specific gravity is ascertained.

Although these are the only general principles by which specific gravities are ascertained, yet as the result is always influenced by the state of the thermometer and barometer at the time of the experiments, and as the manipulation is a work of great nicety, various ingenious instruments have been contrived to render the process and calculation easy. Of all these, the gravimeter of Morveau seems to deserve the preference.

It would be of material consequence to science and the arts, if specific gravities were always indicated by the numerical term expressing their relation to the specific gravity of distilled water. This however is unfortunately not the case. The excise in this country collect the duties paid by spiritous liquors, by estimating the proportion which they contain of a standard spirit, about 0.933 in specific gravity, which they call hydrometer proof, and they express the relation which spirits of a different strength have to the standard spirit by saying that they are above or under hydrometer proof. Thus one to six, or one in seven below hydrometer proof means, that it is equal in strength to a mixture of six parts of proof spirit with one of water.

The only other mode of expressing specific gravities, which it is necessary to notice, is that of Baumé's areometer, as it is often used in the writings of the French chemists, and is little understood in this country. For substances heavier than water he assumes the specific gravity of distilled water as zero, and graduates the stem of his instrument downwards, each degree being supposed by him to express the number of parts of muriate of soda contained in a

given solution, which however is not at all the case. For substances lighter than water the tube is graduated upward, and this zero is afforded by a solution of 1 of salt in 9 water. In the appendix tables are given of the specific gravities, corresponding with all the degrees of both of these areometers, from Nicholson's Journal.

MECHANICAL DIVISION.

334. By mechanical division, substances are reduced to a form better adapted for medical purposes; and by the increase of their surface, their action is promoted, both as medical and chemical agents.

335. It is performed by cutting, bruising, grinding, grating, rasping filing, pulverization, trituration, and granulation, by means of machinery or of proper instruments.

336. *Pulverization* is the first of these operations that is commonly employed in the apothecary's shop. It is performed by means of pestles and mortars. The bottom of the mortars should be concave; and their sides should neither be so inclined as not to allow the substances operated on to fall to the bottom between each stroke of the pestle, nor so perpendicular as to collect it too much together, and to retard the operation. The materials of which the pestles and mortars are formed, should resist both the mechanical and chemical action of the substances for which they are used. Wood, iron, marble, siliceous stones, porcelain, and glass, are all employed; but copper, and metals containing copper, are to be avoided.

337. They should be provided with covers, to prevent the finest and lightest parts from escaping, and to defend the operator from the effects of disagreeable or noxious substances. But these ends are more completely attained, by tying a piece of pliable leather round the pestle and round the mouth of the mortar. It must be closely applied, and at the same time so large, as to permit the free motion of the pestle.

338. In some instances, it will be even necessary for the operator to cover his mouth and nostrils with a wet cloth, and to stand with his back to a current of air, that the very acrid particles which arise may be carried from him.

339. The addition of a little water or spirit of wine, or of a few almonds, to very light and dry substances, will prevent their flying off. But almonds are apt to induce rancidity, and powders are always injured, by the drying which is necessary when they have been moistened. Water must never be added to substances which absorb it, or are rendered cohesive by it.

340. Too great a quantity of any substance must never be put into the mortar at a time, as it very much retards the operation.

341. All vegetable substances must be previously dried. Resins and gummy resins, which become soft in summer, must be powdered in very cold weather, and must be beaten gently, or they will be converted into a paste, instead of being powdered. Wood, roots, barks, horn, bone, ivory, &c. must be previously cut, split, chipped or rasped. Fibrous woods and roots should be finely shaved after their bark is removed, for otherwise, their powders will be full of hair-like filaments, which can scarcely be separated. Some substances will even require to be moistened with mucilage of tragacanth, or of starch, and then dried before they can be powdered. Camphor may be conveniently powdered by the addition of a little spirit of wine, or almond oil. The emulsive seeds cannot be reduced to powder, unless some dry powder be added to them. To aromatic oily substances, sugar is the best addition.

342. All impurities and inert parts having been previously separated, the operation must be continued and repeated upon vegetable substances, till no residuum is left. The powders obtained at different times must then be intimately mixed together, so as to bring the whole to a state of perfect uniformity.

343. Very hard stony substances must be repeatedly heated to a red heat, and then suddenly quenched in cold water, until they become sufficiently friable. Some metals may be powdered hot in a heated iron mortar, or may be rendered brittle by alloying them with a little mercury.

344. *Trituration* is intended for the still more minute division of bodies. It is performed in flat mortars of glass, agate, or other hard materials, by giving a rotatory motion to the pestle; or on a levigating stone, which is generally of porphyry, by means of a muller of the same substance. On large quantities it is performed by rollers of hard stone, turning horizontally upon each other, or by one vertical roller turning on a flat stone.

345. The substances subjected to this operation are generally previously powdered or ground.

346. *Levigation* differs from trituration only in the addition of water or spirit of wine to the powder operated upon, so as to form the whole mass into a kind of paste, which is rubbed until it be of sufficient smoothness or fineness. Earths, and some metallic substances, are levigated.

347. *Granulation* is employed for the mechanical division of some metals. It is performed, either by stirring the melted metal with an iron-rod until it cools, or by pouring it into water, and stirring it continually as before, or by pouring it into a covered box, previously well rubbed with chalk, and shaking it until the metal cools, when the rolling motion will be converted into a

rattling one. The adhering chalk is then to be washed away.

MECHANICAL SEPARATION.

348. *Sifting*. From dry substances, which are reduced to the due degree of minuteness, the coarser particles are to be separated by sieves of iron-wire, hair-cloth or gauze, or by being dusted through bags of fine linen. For very light and valuable powders, or acrid substances, compound sieves, having a close lid and receiver must be used. The particles which are not of sufficient fineness to pass through the interstices of the sieve, may be again powdered.

349. *Elutriation* is confined to mineral substances, on which water has no action. It is performed for separating them from foreign particles and impurities, of a different specific gravity, in which case they are said to be washed; or for separating the impalpable powders, obtained by trituration and levigation from the coarser particles. This process depends upon the property that very fine or light powders have of remaining for some time suspended in water; and is performed by diffusing the powder or paste formed by levigation through plenty of water, letting it stand a sufficient time, until the coarser particles settle at the bottom, and then pouring off the liquid in which the finer or lighter particles are suspended. Fresh water may be poured on the residuum, and the operation repeated; or the coarser particles, which fall to the bottom, may be previously levigated a second time.

350. *Decantation*. The fine powder which is washed over with the water, is separated from it, by allowing it to subside completely, and by either decanting off the water very carefully, or by drawing it off by a syringe or syphon. These processes are very frequently made use of for separating fluids from solids which are specifically heavier, especially when the quantity is very large, or the solid so subtile as to pass through the pores of most substances employed for filtration, or the liquid so acrid as to corrode them.

351. *Filtration*. For the same purpose of separating fluids from solids, straining and filtration are often used. These differ only in degree, and are employed when the powder either does not subside at all, or too slowly and imperfectly for decantation.

352. The instruments for this purpose are of various materials, and must in no instance be acted upon by the substances for which they are employed. Fats, resins, wax and oils, are strained through hemp or flax spread evenly over a piece of wire-cloth or net stretched in a frame. For saccharine and mucilaginous liquors, fine flannel may be used; for some saline solutions, linen. Where these are not fine enough, unsized paper is employed, but it is ex-

tremely apt to burst by hot watery liquors which dissolve its size ; and very acrid liquors, such as acids, are filtered by means of a glass funnel, filled with powdered quartz, a few of the larger pieces being put in the neck, smaller pieces over these, and the fine powder placed over all. The porosity of this last filter retains much of the liquor ; but it may be obtained by gently pouring on it as much distilled water ; the liquor will then pass through, and the water be retained in its place.

353. Water may be filtrated in large quantities through basins of porous stone, or artificial basins of nearly equal parts of fine clay and coarse sand. In large quantities it may be easily purified *per ascensum*, the purified liquor and impurities thus taking opposite directions. The simplest apparatus of this kind is a barrel, divided perpendicularly into two, by a board perforated with a row of holes along the lower edge. Into each side, as much well washed sand is put as will cover these holes an inch or two, over which must be placed a layer of pebbles to keep it steady. The apparatus is now fit for use. Water poured into the one half will sink through the sand in that side, pass through the holes in the division to the other, and rise through the sand in the other half, from which it may be drawn by a stop-cock.

354. The size of the filters depends on the quantity of matter to be strained. When large, the flannel or linen is formed into a conical bag, and suspended from a hoop or frame ; the paper is either spread on the inside of these bags, or folded into a conical form, and suspended by a funnel. It is of advantage to introduce glass rods or quill barrels between the paper and funnel, to prevent them from adhering too closely.

355. What passes first is seldom fine enough, and must be poured back again, until by the swelling of the fibres of the filter, or filling up of its pores, the fluid acquires the requisite degree of limpidity. The filter is sometimes covered with charcoal powder, which is a useful addition to muddy and deep-coloured liquors. The filtration of some viscid substances is much assisted by heat.

356. *Expression* is a species of filtration, assisted by mechanical force. It is principally employed to obtain the juices of fresh vegetables, and the unctuous vegetable oils. It is performed by means of a screw press with plates of wood, iron or tin. The subject of the operation is previously beaten, ground or bruised. It is then inclosed in a bag, which must not be too much filled, and introduced between the plates of the press. The bags should be of hair-cloth, or canvass inclosed in hair-cloth. Hempen and woollen bags are apt to give vegetable juices a disagreeable taste. The pressure should be gentle at first, and increased gradually.

357. Vegetables intended for this operation should be perfectly fresh and freed from all impurities. In general they should be expressed as soon as they are bruised, for it disposes them to ferment; but subacid fruits give a larger quantity of juice and of finer quality, when they are allowed to stand some days in a wooden or earthen vessel after they are bruised. To some vegetables which are not juicy enough for themselves, the addition of a little water is necessary. Lemons and oranges must be peeled, as their skins contain a great deal of essential oil, which would mix with the juice. The oil itself may be obtained separately, by expression with the fingers against a plate of glass.

358. For unctuous seeds iron-plates are used; and it is customary not only to heat the plates, but to warm the bruised seeds in a kettle over the fire, after they have been sprinkled with some water, as by these means the product is increased, and the oil obtained is more limpid. But as their disposition to rancidity is increased by it, if possible this practice should be laid aside, or confined to exposing the bruised seeds, inclosed in a bag, to the steam of hot water.

359. *Despumation* is generally practised on thick and clammy liquors, which contain much slimy and other impurities, not easily separable by filtration. The scum arises either by simply heating the liquor, or by *clarifying* it, which is done by mixing with the liquor, when cold, the whites of eggs well beaten with a little water, which on being heated coagulates, and entangling the impurities of the liquor, rises with them to the surface, and may easily be removed by a perforated ladle. Or the liquor may now be filtered with ease. Spiritous liquors are clarified by means of isinglass dissolved in water, or any albuminous fluid, such as milk, which coagulates by the action of alcohol without the assistance of heat. Some expressed juices, such as those of the antiscorbutic plants, are instantly clarified by the addition of vegetable acid, such as the juice of bitter oranges.

360. Fluids can only be separated from each other, when they have no tendency to combine, and when they differ in specific gravity. The separation may be effected by skimming off the lighter fluid with a silver or glass spoon; or by drawing it off by a syringe or syphon; or by means of a glass separatory, which is an instrument having a projecting tube, terminating in a very slender point, through which the heavier fluid alone is permitted to run; or by means of the capillary attraction of a spongy wool-len thread; for no fluid will enter a substance whose pores are filled by another, for which it has no attraction; and, lastly, upon the same principle, by means of a filter of unsized paper, previously soaked in one of the fluids, which in this way readily passes through it, while the other remains behind.

361. *Mechanical mixture* is performed by agitation; trituration, or kneading; but these will be best considered in treating of the forms in which medicines are exhibited.

APPARATUS.

362. Before entering on the chemical operations, it will be necessary to make a few remarks on the instruments employed in performing them. They may be divided into

- a. The vessels in which the effects are performed.
- b. The means of producing heat; or fuel; and
- c. The means of applying and regulating the heat; or lamps and furnaces.

VESSELS.

363. The vessels, according to the purposes for which they are intended, vary

- a. In form, and
- b. In materials.

364. The different forms will be best described when treating of the particular operations.

365. No substance possesses properties which would render it proper to be employed as a material in every instance. We are therefore obliged to select those substances which possess the properties more especially required in the particular operations for which they are intended.

366. The properties most generally required, are

- a. The power of resisting chemical agents.
- b. Transparency.
- c. Compactness.
- d. Strength.
- e. Fixity and infusibility.
- f. And the power of bearing sudden variations of temperature without breaking.

367. The metals in general possess the four last properties in considerable perfection, but they are all opaque. Iron and copper are apt to be corroded by chemical agents, and the use of the latter is often attended by dangerous consequences. These defects are in some measure, but not entirely, remedied by tinning them. Tin and lead are too fusible. Platinum, gold, and silver, resist most of the chemical agents, but their expence is an insurmountable objection to their general use.

368. Good earthen-ware resists the greatest intensity of heat, but is deficient in all the other properties. The basis of all kinds of earthen-ware is clay, which possesses the valuable quality of being very plastic when wrought with water, and of becoming extremely hard when burnt with an intense heat. But it contracts

so much by heat, that it is extremely apt to crack and split on being exposed to sudden changes of temperature; it is therefore necessary to add some substance which may counteract this property. Siliceous sand, clay reduced to powder, and then burnt with a very intense heat, and plumbago, are occasionally used. These additions, however, are attended with other inconveniencies; plumbago especially is liable to combustion, and sand diminishes the compactness; so that when not glazed, they are porous, and when glazed, they are acted upon by chemical agents. The chemical vessels, manufactured by Messrs Wedgwood, are the best of this description, except porcelain, which is too expensive.

369. Glass possesses the three first qualities in an eminent degree, and may be heated red-hot without melting. Its greatest inconvenience is its disposition to crack or break in pieces when suddenly heated or cooled. As this is occasioned by its unequal expansion or contraction, it is best remedied by forming the vessels very thin, and giving them in general a rounded form. Glass-vessels should also be well annealed, that is, cooled very slowly, after being blown, by placing them immediately in an oven while they are yet in a soft state. While ill annealed, or cooled suddenly, glass is apt to fly in pieces on the slightest change of temperature, or touch of a sharp point. We sometimes take advantage of this imperfection; for by means of a red-hot wire, glass-vessels may be cut into any shape. When there is not a crack already in the glass, the point of the wire is applied near the edge, a crack is formed, which is afterwards easily led in any direction we wish.

370. Reaumur's porcelain, on the contrary, is glass, which by surrounding it with hot sand, is made to cool so slowly, that it assumes a crystalline texture, which destroys its transparency, but imparts to it every other quality wished for in chemical vessels. The coarser kinds of glass are commonly used in making it; but as there is no manufacture of this valuable substance, its employment is still very limited.

LUTES.

371. Lutes also form a necessary part of chemical apparatus. They are compositions of various substances, intended

- a. To close the joining of vessels.
- b. To coat glass-vessels.
- c. To line furnaces.

372. Lutes of the first description are commonly applied to confine elastic vapours. They should therefore possess the following properties,

- a. Viscidity, plasticity, and compactness.
- b. The power of resisting acrid vapours.

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371. LUTES also form a necessary part of chemical apparatus. They are compositions of various substances, intended

- a.* To close the joinings of vessels.
- b.* To coat glass vessels.
- c.* To line furnaces.

372. Lutes of the first description are commonly employed to confine elastic vapours. They should therefore possess the following properties,

- a.* Viscidity, plasticity, and compactness.
- b.* The power of resisting acrid vapours.
- c.* The power of resisting certain degrees of heat.

373. The viscidity of lutes depends on the presence either of

- a.* Unctuous or resinous substances.
- b.* Mucilaginous substances, or
- c.* Clay or lime.

374. Lutes of the first kind (373. *a.*) possess the two first class of properties in an eminent degree; but they are in general so fusible that they cannot be employed when they are exposed even to very low degrees of heat, and they will not adhere to any substance that is at all moist. Examples:

- a.* Eight parts of yellow wax, melted with one of oil of turpentine, with or without the addition of resinous substances, according to the degree of pliability and consistence required. Lavoisier's lute.
- b.* Four parts of wax, melted with two of varnish and one of olive oil. Saussure's lute.
- c.* Three parts of powdered clay, worked up into a paste, with one of drying oil, or, what is better, amber varnish. The drying oil is prepared by boiling 22.5 parts of litharge in 16 of linseed oil until it be dissolved. Fat lute.
- d.* Chalk and oil, or glazier's putty, is well fitted for luting tubes permanently into glass vessels, for it becomes so hard that it cannot be easily removed.
- e.* Equal parts of litharge, quicklime, and powdered clay, worked into a paste with oil varnish, is sometimes used

to daub over the cracks in glass vessels, so as to render them again fit for some purposes.

f. Melted pitch and brick dust.

375. Mucilaginous substances (373. *b.*) such as flour, starch, gum, and glue, mixed with water, with or without some powder, are sufficiently adhesive, are dried by moderate degrees of heat, and are easily removed after the operation, by moistening them with water; but a high temperature destroys them, and they do not resist corrosive vapours. Examples.

- a.* Slips of bladder macerated in water, and applied with the inside next the vessels. They are apt, however, from their great contraction in drying, to break weak vessels.
- b.* One part of gum arabic with six or eight of chalk, formed into a paste with water.
- c.* Flour worked into a paste with powdered clay or chalk.
- d.* Almond or linseed meal formed into a paste with mucilage or water.
- e.* Quicklime in fine powder, hastily mixed with white of egg, and instantly applied, sets very quickly, but becomes so hard that it can scarcely be removed.
- f.* Slaked lime in fine powder, with glue, does not set so quickly as the former.
- g.* The cracks of glass vessels are sometimes mended by daubing them and a suitable piece of linen over with white of egg, strewing both over with finely powdered quicklime, and instantly applying the linen closely and evenly.

376. Earthy lutes (373. *c.*) resist very high temperatures, but they become so hard that they can scarcely be removed, and often harden so quickly after they are mixed up, that they must be applied immediately. Examples.

- a.* Quicklime well incorporated with a sixth part of muriate of soda.
- b.* Burnt gypsum, made up with water.
- c.* One ounce of borax dissolved in a pound of boiling water, mixed with a sufficient quantity of powdered clay. Mr. Watt's fire lute.
- d.* One part of clay with four of sand, formed into a paste with water. This is also used for coating glass vessels, in order to render them stronger, and capable of resisting violent degrees of heat. It is then made into a very thin mass, and applied in successive layers, tak-

ing care that each coat be perfectly dry before another be laid on.

377. The lutes for lining furnaces will be described when treating of furnaces.

378. The junctures of vessels which are to be luted to each other, must previously be accurately and firmly fitted, by introducing between them, when necessary, short bits of wood, or cork, or, if the disproportion be very great, by means of a cork fitted to the one vessel, having a circular hole bored through it, through which the neck of the other vessel or tube passes.

379. After being thus fitted, the lute is either applied very thin, by spreading it on slips of linen or paper, and securing it with thread, or if it is a paste lute, it is formed into small cylinders, which are successively applied to the junctures, taking care that each piece be made to adhere firmly and perfectly close in every part before another is put on. Lastly, the whole is secured by slips of linen or bladder.

380. In many cases, to permit the escape of elastic vapours, a small hole is made through the lute with a pin, or the lute is perforated by a small quill, fitted with a stopper.

HEAT AND FUEL.

381. As caloric is an agent of the most extensive utility in the chemical operations of pharmacy, it is necessary that we should be acquainted with the means of employing it in the most economical and efficient manner.

382. The rays of the sun are used in the drying of many vegetable substances, and the only attentions necessary are to expose as large a surface as possible, and to turn them frequently, that every part may be dried alike. They are also sometimes used for promoting spontaneous evaporation.

383. The combustion of different substances is a much more powerful and certain source of heat. The substances employed for this purpose are either fluid or solid. Alcohol, oil, tallow, wood, turf, coal, charcoal, and coke, are all occasionally employed.

384. Alcohol, oil, and melted tallow, fluid inflammables, must be burnt on porous wicks. These act merely mechanically, by drawing up a portion of the fluid to be volatilized and inflamed. They are therefore burnt in lamps of various constructions. But although commonly used to produce light, they afford a very uniform, though not very high temperature. It may however be increased by increasing the number of the wicks and their size.

Alcohol produces a steady heat, no soot, and, if strong, leaves no residuum. Oil gives a higher temperature, but on a common wick produces much smoke and soot. These are diminished, and the light and heat increased, by making the surface of the flame bear a large proportion to the centre, which is best done by a cylindrical wick, so contrived that the air has free access both to the outside and to the inside of the cylinder, as in Argand's lamp, invented by Mr. Boulton of Birmingham. In this way oil may be made to produce a considerable temperature, of great uniformity, and without the inconvenience of smoke.

385. Wicks have the inconvenience of being charred by the high temperature to which they are subjected, and becoming so clogged as to prevent the fluid from rising in them. They must then be trimmed, but this is seldomer necessary with alcohol and fine oils than with the coarser oils. Lamps are also improved by adding a chimney to them. It must admit the free access of air to the flame, and then it increases the current, confines the heat, and steadies the flame. The intensity of the temperature of flame may be increased astonishingly by forcing a small current of hot air through it as by the blow pipe.

386. Wood, turf, coal, charcoal, and coke, solid combustibles, are burnt in grates and furnaces. Wood has the advantage of kindling readily, but affords a very unsteady temperature, is inconvenient from its flame, smoke, and soot, and requires much attention. The heavy and dense woods give the greatest heat, burn longest, and leave a dense charcoal.

387. Dry turf gives a steady heat, and does not require so much attention as wood; but it consumes fast, its smoke is copious and penetrating, and the empyreumatic smell which it imparts to every thing it comes in contact with, adheres to them with great obstinacy. The heavy turf of marshes is preferable to the light superficial turf.

388. Coal is the fuel most commonly used in this country. Its heat is considerable and sufficiently permanent, but it produces much flame and smoke.

389. Charcoal, especially of the dense woods, is a very convenient and excellent fuel. It burns without flame or smoke, and gives a strong, uniform, and permanent heat, which may be easily regulated, especially when it is not in too large pieces, and is a little damp. But it is costly, and burns quickly.

390. Coke, or charred coal, possesses similar properties to charcoal, it is less easily kindled, but is capable of producing a higher temperature, and burns more slowly.

391. When an open grate is used for chemical purposes, it should be provided with cranes to support the vessels operated in, that they may not be overturned by the burning away of the fuel.

FURNACES.

392. In all furnaces, the principal objects are, to produce a sufficient degree of heat, with little consumption of fuel, and to be able to regulate the degree of heat.

393. An unnecessary expenditure of fuel is prevented by forming the sides of the furnace of very imperfect conductors of caloric, and by constructing it so that the subject operated on may be exposed to the full action of the fire.

394. The degree of heat is regulated by the quantity of air which comes in contact with the burning fuel. The quantity of air is in the compound ratio of the size of the aperture through which it enters and its velocity. The velocity is increased by mechanical means, as by bellows, or by increasing the height and width of the chimney.

395. The size and form of furnaces, and the materials of which they are constructed are various, according to the purposes for which they are intended.

396. The essential parts of a furnace are,

- a. A body for the fuel to burn in.
- b. A grate for it to burn upon.
- c. An ash-pit to admit air and receive the ashes.
- d. A chimney for carrying off the smoke and vapours.

397. The ash-pit should be perfectly close, except the door, which should be furnished with a register-plate to regulate the quantity of air admitted.

398. The bars of the grate should be triangular, and placed with an angle pointed downwards, and not above half an inch distant. The grate should be fixed on the outside of the body.

399. The body may be cylindrical or elliptical, and it must have apertures for introducing the fuel and the subjects of the operation, and for conveying away the smoke and vapours.

400. When the combustion is supported by the current of air naturally excited by the burning of the fuel, it is called a wind-furnace; when it is accelerated by increasing the velocity of the current by bellows, it forms a blast-furnace; and when the body of the furnace is covered with a dome, which terminates in the chimney, it constitutes a reverberatory furnace.

401. Furnaces are either fixed, and built of fire-brick, or portable, and fabricated of plate-iron. When of iron, they must be lined with some badly conducting and refractory substance, both to prevent the dissipation of heat, and to defend the iron against the action of the fire. A mixture of scales of iron and powdered tiles worked up with blood, hair, and clay, is much recommend-

ed; and Professor Hagen says, that it is less apt to split and crack when exposed at once to a violent heat, than when dried gradually, according to the common directions. Dr. Black employed two different coatings. Next to the iron he employed a composition of three parts by weight of charcoal, and one of fine clay. These are first mixed in the state of fine powder, and then worked up with as much water as will permit the mass to be formed into balls, which are applied to the sides of the furnace, and beat very firm and compact with the face of a broad hammer, to the thickness of about one inch and a half in general, but so as to give an elliptical form to the cavity. Over this, another lute, composed of six or seven parts of sand, and one of clay, is to be applied in the same manner, to the thickness of about half an inch. These lutes must be allowed to become perfectly dry before the furnace is heated, which should at first be done gradually. They may also be lined with fire bricks of a proper form, accurately fitted and well cemented together before the top plate is screwed on.

402. The general fault of furnaces is, that they admit too much air, which prevents us from regulating the temperature. It either becomes too violent and unmanageable, or when more cold air is admitted than what is necessary for supporting the combustion, it carries off heat, and prevents us from raising the temperature as high as we otherwise would. The superior merit of Dr. Black's furnace consists in the facility with which the admission of air is regulated; and every attempt hitherto made to improve it, by increasing the number of its apertures, have in reality injured it.

403. Heat may be applied to vessels employed in chemical operations,

- a. Directly, as in the open fire and reverberatory furnace.
- b. Or through the medium of sand; the sand-bath.
- c. Of water; the water bath.
- d. Of steam; the vapour-bath.
- e. Of air, as in the muffle.

CHEMICAL OPERATIONS.

404. In all chemical operations, combination takes place, and there are very few of them in which decomposition does not also occur. For the sake of method, we shall consider them as principally intended to produce

- a. A change in the form of aggregation.
- b. Combination.
- c. Decomposition.

405. The form of aggregation may be altered by

- a. Fusion.
- b. Vaporization.
- c. Condensation.
- d. Congelation.
- e. Coagulation.

406. *Liquefaction* is commonly employed to express the melting of substances, as tallow, wax, resin, &c. which pass through intermediate states of softness before they become fluid. Fusion is the melting of substances which pass immediately from the solid to the fluid state, as the salts and metals, except iron and platinum.

407. *Fusion* is the conversion of a solid into a liquid by the sole agency of caloric. Substances differ very much in the degrees of their fusibility; some, as water and mercury, existing as fluids in the ordinary temperatures of the atmosphere; while others, as the pure earths, cannot be melted by any heat we can produce.

408. When in consequence of fusion the subjects operated on acquire a greater or less degree of transparency, a dense uniform texture, and great brittleness, and exhibit a conchoidal fracture, with a specular surface, and the edges of the fragments very sharp; it is termed *vittrification*.

409. In general, simple substances are less fusible than compounds; for example, the simple earths cannot be melted singly, but when mixed, are easily fused. The additions which are sometimes made to refractory substances to promote their fusion, are termed *fluxes*.

410. These fluxes are generally saline bodies.

a. The alkalies potash and soda, promote powerfully the fusion of siliceous stones; but they are only used for accurate experiments. The *white flux* is a mixture of a little potash with carbonate of potash, and is prepared by deslagrating together equal parts of nitrate of potash and super-tartrate of potash. When an oxide is at the same time to be reduced, the *black flux* is to be preferred, which is produced by the deslagration of two parts of super-tartrate of potash, and one of nitrate of potash. It differs from the former only in containing a little charcoal. Soap promotes fusion by being converted by the fire into carbonate of soda and charcoal.

b. Aluminous stones have their fusion greatly promoted by the addition of sub-borate of soda.

- c. Muriate of soda, the mixed phosphate of soda and ammonia, and other salts, are also occasionally employed.

411. An open fire is sufficient to melt some substances, others require the heat of a furnace.

412. The vessels in which fusion is performed, must resist the heat necessary for the operation. In some instances, an iron or copper ladle or pot may be used, but most commonly crucibles are employed. Crucibles are of various sizes. The large crucibles are generally conical, with a small spout for the convenience of pouring out; the small ones are truncated triangular pyramids, and are commonly sold in nests.

413. The Hessian crucibles are composed of clay and sand, and when good, will support an intense heat for many hours, without softening or melting; but they are disposed to crack when suddenly heated or cooled. This inconvenience may be on many occasions avoided, by using a double crucible, and filling up the interstice with sand, or by covering the crucible with a lute of clay and sand, by which means the heat is transmitted more gradually and equally. Those which ring clearly when struck, and are of an uniform thickness, and have a reddish brown colour, without black spots, are reckoned the best.

414. Wedgewood's crucibles are made of clay mixed with baked clay finely pounded, and are in every respect superior to the Hessian, but they are very expensive.

415. The black-lead crucibles, formed of clay and plumbago, are very durable, resist sudden changes of temperature, and may be repeatedly used, but they are destroyed when saline substances are melted in them, and suffer combustion when exposed red-hot to a current of air.

416. When placed in a furnace, crucibles should never be set upon the bars of the grate, but always upon a support. Dr. Kennedy found the hottest part of a furnace to be about an inch above the grate. They may be covered, to prevent the fuel or ashes from falling into them, with a lid of the same materials, or with another crucible inverted over them.

417. When the fusion is completed, the substance may be either permitted to cool in the crucible, or may be poured into a heated mould anointed with tallow, never with oil, or what is still better, covered with a thin coating of chalk, which is applied by laying it over with a mixture of chalk diffused in water, and then evaporating the water completely by heat. To prevent the crucible from being broken by cooling too rapidly, it is to be either replaced in the furnace, to cool gradually with it, or covered with some vessel to prevent its being exposed immediately to the air.

418. Fusion is performed with the intentions,

a. Of weakening the attraction of aggregation.

1. To facilitate mechanical division.

2. To promote chemical action.

b. Of separating from each other, substances of different degrees of fusibility.

419. *Vaporization* is the conversion of a solid or fluid into vapour by the agency of caloric. Although vaporability be merely a relative term, substances are said to be permanently elastic, volatile, or fixed. The permanently elastic fluids or gases are those which cannot be condensed into a fluid or solid form by any abstraction of caloric we are capable of producing. Fixed substances, on the contrary, are those which cannot be converted into vapour by great increase of temperature. The pressure of the atmosphere has very considerable effect in varying the degree at which substances are converted into vapour. Some solids, unless subjected to very great pressure, are at once converted into vapour, although most of them pass through the intermediate state of fluidity.

420. Vaporization is employed

a. To separate substances differing in volatility.

b. To promote chemical action, by disaggregating them.

421. When employed with either of these views, either

a. No regard is paid to the substances volatilized,

1. From solids, as in ustulation and charring.

2. From fluids, as in evaporation.

b. Or the substances vaporized are condensed in proper vessels,

1. In a liquid form, as in distillation.

2. In a solid form, as in sublimation.

c. Or the substances vaporized are permanently elastic, and are collected in their gaseous form, in a pneumatic apparatus.

422. *Ustulation* is almost entirely a metallurgic operation, and is employed to expel the sulphur and arsenic contained in some metallic ores. It is performed on small quantities in tests placed within a muffle. Tests are shallow vessels made of bone ashes or baked clay. Muffles are vessels of baked clay, of a semi-cylindrical form, the flat side forming the floor, and the arched portion the roof and sides. The end and sides are perforated with holes for

the free transmission of the heated air, and the open extremity is placed at the door of the furnace, for the inspection and manipulation of the process. The reverberatory furnace is commonly employed for roasting, and the heat is at first very gentle, and slowly raised to redness. It is accelerated by exposing as large a surface of the substance to be roasted as possible, and by stirring it frequently, so as to prevent any agglutination, and to bring every part in succession to the surface.

423. *Charring* may be performed on any of the compound oxides, by subjecting them to a degree of heat sufficient to expel all their hydrogen, nitrogen, and superabundant oxygen, while the carbon, being a fixed principle, remains behind in the state of charcoal. The temperature necessary for the operation may be produced either by the combustion of other substances, or by the partial combustion of the substance to be charred. In the former case, the operation may be performed in any vessel which excludes the access of air, while it permits the escape of the vapours formed. In the latter, the access of air must be regulated in such a manner, that it may be suppressed whenever the combustion has reached the requisite degree; for if continued to be admitted, the charcoal itself would be dissipated in the form of carbonic acid gas, and nothing would remain but the alkaline and earthy matter, which these substances always contain. When combustion is carried this length, the process is termed *incineration*. The vapours which arise in the operation of charring, are sometimes condensed, as in the manufacture of tar.

424. *Evaporation* is the conversion of a fluid into vapour, by its combination with caloric. In this process, the atmosphere is not a necessary agent, but rather a hinderance, by its pressure. This forms a criterion between evaporation and spontaneous evaporation, which is merely the solution of a fluid in air.

425. It is performed in open, shallow, or hemispherical vessels of silver, tinned copper or iron, earthen-ware or glass. The necessary caloric may be furnished by means of an open fire, a lamp, or a furnace, either immediately, or with the intervention of sand, water, or vapour. The degree of heat must be regulated by the nature of the substance operated on. In general, it should not be greater than what is absolutely necessary.

426. Evaporation may be,

a. Partial.

1. From saline fluids, concentration.
2. From viscid fluids, inspissation.

b. Total, exsiccation.

427. *Concentration* is employed,

- a. To lessen the quantity of diluting fluids, deflegmation.
- b. As a preliminary step to crystallization.

428. *Insuffation* is almost confined to animal and vegetable substances; and as these are apt to be partially decomposed by heat, or to become empyreumatic, it should always be performed, especially towards the end of the process, in a water or vapour bath.

429. *Exsiccation* is here taken in a very limited sense; for the term is also with propriety used to express the drying of vegetables by a gentle heat, the efflorescence of salts, and the abstraction of moisture from mixtures of insoluble powders with water, by means of chalk-stones or powdered chalk pressed into a smooth mass. At present, we limit its meaning to the total expulsion of moisture from any body by means of caloric.

430. The exsiccation of compound oxides should always be performed in the water bath.

431. Salts are deprived of their water of crystallization by exposing them to the action of heat in a glass vessel or iron ladle. Sometimes they first dissolve in their water of crystallization, or undergo what is called the *watery fusion*, and are afterwards converted into a dry mass by its total expulsion; as in the calcination of borax or burning of alum.

432. When exsiccation is attended with a crackling noise, and splitting of the salt, as in muriate of soda, it is termed *decrepitation*, and is performed by throwing into a heated iron vessel, small quantities of the salt at a time, covering it up, and waiting until the decrepitation be over, before a fresh quantity is thrown in.

433. Exsiccation is performed on saline bodies, to render them more acrid or pulverulent, or to prepare them for chemical operations. Animal and vegetable substances are exsiccated to give them a solid form, and to prevent their fermentation.

434. *Condensation* is the reverse of expansion, and is produced either,

- a. By mechanical pressure forcing out the caloric in a sensible form, as water is squeezed out of a sponge, or,
- b. By the chemical abstraction of caloric, which is followed by an approximation of the particles of the substance.

435. The latter species of condensation only is the object of our investigation at present. In this way we may be supposed to condense,

- a. Substances existing naturally as gases, or vapours.
- b. Substances, naturally solid or fluid, converted into vapours by adventitious circumstances.

436. The former instance is almost supposititious; for, except the oxygenized muriatic acid gas, we are not able, by any diminution of temperature, to reduce the permanently elastic fluids, to a fluid or solid state.

437. The latter instance is always preceded by vaporization, and comprehends those operations in which the substances vaporised are condensed in proper vessels. When the product is a fluid, it is termed distillation; when solid, sublimation.

438. *Distillation* is said to be performed,

- a. *Viâ humidâ*, when fluids are the subjects of the operation.
- b. *Viâ siccâ*, when solids are subjected to the operation, and the fluid product arises from decomposition, and a new arrangement of the constituent principles.

439. The objects of distillation are,

- a. To separate more volatile fluids from less volatile fluids or solids.
- b. To promote the union of different substances.
- c. To generate new products by the action of fire.

440. In all distillations, the heat applied should not be greater than what is necessary for the formation of the vapour, and even to this degree it should be gradually raised. The vessels also in which the distillation is performed, should never be filled above one-half, and sometimes not above one-fourth, lest the substance contained in them should boil over.

441. As distillation is a combination of evaporation and condensation, the apparatus consists of two principal parts:

- a. The vessels in which the vapours are formed.
- b. The vessels in which they are condensed.

442. The vessels employed for both purposes are very various in their shapes, according to the manner in which the operation is conducted. The first difference depends on the direction of the vapour after its formation. It either,

- a. Descends; distillation *per descensum*.
- b. Ascends; distillation *per ascensum*.
- c. Or passes off by the side; distillation *per latus*.

443. In the distillation *per descensum*, a perforated plate of tinned iron, or other materials, is fixed within any convenient vessel, so as to leave a space beneath it. On this the subject of the operation is laid, and over it is placed another plate, accurately closing the mouth of the vessel, and sufficiently strong to support the fuel. Thus the heat is applied from above, and the vapour is forced to descend into the inferior cavity, where it is condensed. In this way the oil of cloves is prepared, and on the same principles tar is manufactured, and mercury and zinc are separated from their ores.

444. In the distillation *per ascensum*, the vapour is allowed to arise to some height, and then is conveyed away to be condensed. The vessel most commonly employed for this purpose is the common copper still, which consists of a body for containing the materials, and a head into which the vapour ascends. From the middle of the head a tube rises for a short way, and is then reflected downwards, through which the steam passes to be condensed. Another kind of head, rising to a great height before it is reflected, is sometimes used for separating fluids, which differ little in volatility, as it was supposed that the less volatile vapours would be condensed and fall back into the still, while only the more volatile vapours would arise to the top, so as to pass to the refrigeratory. The same object may be more conveniently attained by managing the fire with caution and address. The greater the surface exposed, and the less the height the vapours have to ascend, the more rapidly does the distillation proceed; and so well are these principles understood by the Scotch distillers, that they do not take more than three minutes to discharge a still containing 50 gallons of fluid.

445. The condensing apparatus used with the common still is very simple. The tube in which the head terminates, is inserted into the upper end of a pipe, which is kept cool by passing through a vessel filled with water, called the Refrigeratory. This pipe is commonly made of a serpentine form; but as this renders it difficult to be cleaned, Dr. Black recommends a sigmoid pipe. The refrigeratory may be furnished with a stop-cock, that when the water it contains becomes too hot, and does not condense all the vapour produced, it may be changed for cold water. From the lower end of the pipe, the product of the distillation drops into the vessel destined to receive it; and we may observe, that when any vapour issues along with it, we should either diminish the power of the fire, or change the water in the refrigeratory.

446. *Circulation* was a process formerly in use. It consisted in arranging the apparatus, so that the vapours were no sooner condensed into a fluid form, than this fluid returned back into the distilling vessels, to be again vaporized; and was effected by distil-

ling in a glass vessel, with so long a neck that the vapours were condensed before they escaped at the upper extremity, or by inverting one matrafs within another.

447. When corrosive substances are distilled in this way, the cucurbit and alembic are used; but these substances are more conveniently distilled *per latus*.

448. The distillation *per latus* is performed in a retort, or pear-shaped vessel, having the neck bent to one side. The body of a good retort is well rounded, uniform in its appearance, and of an equal thickness, and the neck is sufficiently bent to allow the vapours, when condensed, to run freely away, but not so much as to render the application of the receiver inconvenient, or to bring it too near the furnace. The passage from the body into the neck must be perfectly free and sufficiently wide, otherwise the vapours produced in the retort only circulate in its body, without passing over into the receiver. For introducing liquors into the retort without soiling its neck, which would injure the product, a bent funnel is necessary. It must be sufficiently long to introduce the liquor directly into the body of the retort; and in withdrawing it, we must carefully keep it applied to the upper part of the retort, that the drop hanging from it may not touch the inside of the neck. In some cases, where a mixture of different substances is to be distilled, it is convenient and necessary to have the whole apparatus properly adjusted before the mixture is made, and we must therefore employ a tubulated retort, or a retort furnished with an aperture, accurately closed with a ground stopper.

449. The tubulature should be placed on the upper convex part of the retort before it bends to form the neck, so that a fluid poured through it may fall directly into the body without soiling the neck.

450. Retorts are made of various materials. Flint-glass is commonly used when the heat is not so great as to melt it. For distillations which require excessive degrees of heat, retorts of earthenware, or coated (376. d.) glass retorts are employed. Quick-silver is distilled in iron retorts.

451. The simplest condensing apparatus used with the retort, is the common glass-receiver; which is a vessel of a conical or globular form, having a neck sufficiently wide to admit of the neck of the retort being introduced within it. To prevent the loss and dissipation of the vapours to be condensed, the retort and receiver may be accurately ground to each other, or secured by some proper lute. To prevent the receiver from being heated by the caloric evolved during the condensation of vapours in it, we must employ some means to keep it cool. It is either immersed in cold water, or covered with snow, or pounded ice, or a constant evaporation is supported from its surface, by covering it with a cloth, which is

kept moist by means of the descent of water, from a vessel placed above it, through minute syphons or spongy worsted threads. But as, during the process of distillation, permanently elastic fluids are often produced, which would endanger the breaking of the vessels, these are permitted to escape either through a tubulature, or hole in the side of the receiver, or rather through a hole made in the luting (380.) Receivers having a spout issuing from their side, are used when we wish to keep separate the products obtained at different periods of any distillation. For condensing very volatile vapours, a series of receivers, communicating with each other, termed *Adopters*, were formerly used; but these are now entirely superseded by Woulfe's apparatus.

452. This apparatus consists of a tubulated retort, adapted to a tubulated receiver. With the tubulature of the receiver, a three-necked bottle is connected by means of a bent tube, the further extremity of which is immersed, one or more inches, in some fluid contained in the bottle. A series of two or three similar bottles are connected with this first bottle in the same way. In the middle tubulature of each bottle, a glass tube is fixed, having its lower extremity immersed about a quarter of an inch in the fluid. The height of the tube above the surface of the fluid must be greater than the sum of the columns of fluid standing over the further extremities of the connecting tubes, in all the bottles or vessels more remote from the retort. Tubes so adjusted are termed *Tubes of Safety*, for they prevent that reflux of fluid from the more remote into the nearer bottles, and into the receiver itself, which would otherwise inevitably happen, on any condensation of vapour taking place in the retort, receiver, or nearer bottles. Different contrivances for the same purpose have been described by Messrs Welter and Burkitt; and a very ingenious mode of connecting the vessels without lute, has been invented by Citizen Girard, but they would not be easily understood without plates. The further tubulature of the last bottle is commonly connected with a pneumatic apparatus, by means of a bent tube. When the whole is properly adjusted, air blown into the retort should pass through the receiver, rise in bubbles through the fluids contained in each of the bottles, and at last escape by the bent tube. In the receiver, those products of distillation are collected, which are condensable by cold alone. The first bottle is commonly filled with water, and the others with alkaline solutions, or other active fluids; and as the permanently elastic fluids produced, are successively subjected to the action of all of these, only those gases will escape by the bent tube which are not absorbable by any of them.

PNEUMATIC APPARATUS.

453. The great importance of the elastic fluids in modern chemistry, has rendered an acquaintance with the means of collecting and preserving them indispensable.

454. When a gas is produced by any means, it may be received either,

- a.* Into vessels absolutely empty ; or,
- b.* Into vessels, filled with some fluid, on which it exerts no action.

455. The first mode (425. *a.*) of collecting gases, may be practised by means of a bladder, moistened sufficiently to make it perfectly pliable, and then compressed so as to press out every particle of air from its cavity. In this state it may be easily filled with any gas. An oiled silk bag will answer the same purpose, and is more convenient in some respects, as it may be made of any size or form.

456. Glass or metallic vessels, such as balloons, may also be emptied for the purpose of receiving gases, by fitting them with a stop-cock, and exhausting the air from them by means of an air-pump.

457. But the second mode (425. *b.*) of collecting gases is the most convenient and common.

458. The vessels may be filled either,

- a.* With a fluid lighter ; or,
- b.* Heavier than the gas to be received into it.

459. The former method is seldom employed ; but if we conduct a stream of any gas heavier than atmospheric air, such as carbonic acid gas, muriatic acid gas, &c. to the bottom of any vessel, it will gradually displace the air, and fill the vessel.

460. On the contrary, a gas lighter than atmospheric air, such as hydrogen, may be collected in an inverted vessel by conducting a stream of it to the top.

461. But gases are most commonly collected by conducting the stream of gas into an inverted glass-jar, or any other vessel filled with water or mercury. The gas ascends to the upper part of the vessel, and displaces the fluid. In this way gas may be kept a very long time, provided a small quantity of the fluid be left in the vessels, which prevents both the escape of the gas, and the admission of atmospheric air.

462. The vessels may be of various shapes ; but the most com-

monly employed are cylindrical. They may be either open only at one extremity, or furnished at the other with a stop-cock.

463. The manner of filling these vessels with fluid, is to immerse them completely in it, with the open extremity directed a little upwards, so that the whole air may escape from them, and then inverting them with their mouths downwards.

464. For filling them with convenience, a trough or cistern is commonly used. This either should be hollowed out of a solid block of wood or marble; or, if it be constructed of wood simply, it must be well painted, or lined with lead or tinned copper. Its size may vary very much; but it must contain a sufficient depth of fluid to cover the largest transverse diameter of the vessels to be filled in it. At one end or side, there should be a shelf for holding the vessels after they are filled. This shelf should be placed about an inch and a half below the surface of the fluid, and should be perforated with several holes, forming the apices of corresponding conical excavations on the lower side, through which, as through inverted funnels, gaseous fluids may be more easily introduced into the vessels placed over them.

465. In general, the vessels used with a mercurial apparatus should be stronger and smaller than those for a water-cistern, and we must have a variety of glass and elastic tubes for conveying the gases from the vessels in which they are formed to the funnels under the shelf.

466. *Rectification* is the repeated distillation of any fluid. When distillation renders the fluid stronger, or abstracts water from it, it is termed *Dephlegmation*. When a fluid is distilled off from any substance, it is called *Abstraction*; and if the product be redistilled from the same substance, or a fresh quantity of the same substance, it is denominated *Cobobation*.

467. *Sublimation* differs from distillation only in the form of the product. When it is compact, it is termed a Sublimate; when loose and spongy, it formerly had the improper appellation of Flowers. Sublimation is sometimes performed in a crucible, and the vapours are condensed in a paper cone, or in another crucible inverted over it; sometimes in the lower part of a glass flask, cucurbit or phial, and the condensation is effected in the upper part or capital, and sometimes in a retort with a very short and wide neck, to which a conical receiver is fitted. The heat is most commonly applied through the medium of a sand-bath; and the degree of heat, and the depth to which the vessel is inserted in it, are regulated by the nature of the sublimation.

468. *Congelation* is the reduction of a fluid to a solid form, in consequence of the abstraction of caloric. The means employed for abstracting caloric are the evaporation of volatile fluids, the solution of solids, and the contact of cold bodies.

469. *Coagulation* is the conversion of a fluid into a solid of greater or less consistence, merely in consequence of a new arrangement of its particles, as during the process there is no separation of caloric or any other substance. The means of producing coagulation, are increase of temperature, and the addition of certain substances, as acids and runnets.

COMBINATION.

470. Chemical combination is the intimate union of the particles of at least two heterogeneous bodies. It is the effect resulting from the exertion of the attraction of affinity, and is therefore subjected to all the laws of affinity.

471. To produce the chemical union of any bodies, it is necessary,

1. That they possess affinity for each other.
2. That their particles come into actual contact.
3. That the strength of the affinity be greater than any counteracting causes which may be present.

472. The principal counteracting causes are,

1. The attraction of aggregation.
2. Affinities for other substances.

473. The means to be employed for overcoming the action of other affinities will be treated of under Decomposition.

474. The attraction of aggregation is overcome by means of

1. Mechanical division.
2. The action of caloric.

475. Combination is facilitated by increasing the points of actual contact,

1. By mechanical agitation.
2. By condensation ; compression.

476. The processes employed for producing combination, may be considered,

1. With regard to the nature of the substances combined ; and,
2. To the nature of the compound produced.

Gases,

1. Combine with gases ;
2. And dissolve fluids or solids ;
3. Or are absorbed by them.

Fluids,

1. Are dissolved in gases ;
2. Or absorb them.
3. Combine with fluids,
4. And dissolve solids ;
5. Or are rendered solid by them.

Solids,

1. Are dissolved in fluids and in gases ; or
2. Absorb gases,
3. And solidify fluids.

477. The combination of gases with each other, in some instances, takes place when simply mixed together : thus nitrous and oxygen gases combine as soon as they come into contact ; in other instances, it is necessary to elevate their temperature to a degree sufficient for their inflammation, either by means of the electric spark, or the contact of an ignited body, as in the combination of oxygen gas with hydrogen or nitrogen gas.

478. When gases combine with each other, there is always a considerable diminution of bulk, and not unfrequently they are condensed into a liquid or solid form. Hydrogen and oxygen gases form water ; muriatic acid and ammonia gases form solid muriate of ammonia. But when the combination is effected by ignition, a violent expansion, which endangers the bursting of the vessels, previously takes place, in consequence of the increase of temperature.

479. *Solution* is the diminution of aggregation in any solid or fluid substance, in consequence of its entering into chemical combination. The substance, whether solid or fluid, whose aggregation is lessened, is termed the *Solvent* ; and the substance, by whose agency the solution is effected, is often called the *Mentruum* or *Solvent*.

480. Solution is said to be performed *viâ humidâ*, when the natural form of the solvent is fluid ; but when the agency of heat is necessary to give the solvent its fluid form, the solution is said to be performed *viâ siccâ*.

481. The dissolving power of each menstruum is limited, and is determinate with regard to each solvend. The solubility of bodies is also limited and determinate with regard to each menstruum.

482. When any menstruum has dissolved the greatest possible quantity of any solvend, it is said to be saturated with it. But, in some cases, although saturated with one substance, it is still capable of dissolving others. Thus a saturated solution of muriate of soda will dissolve a certain quantity of nitrate of potash, and after that a portion of muriate of ammonia.

483. The dissolving power of solvents, and consequently the solubility of solvents, are generally increased by increase of temperature: and conversely, this power is diminished by diminution of temperature; so that, from a saturated solution, a separation of a portion of the solvend generally takes place on any reduction of temperature. This property becomes extremely useful in many chemical operations, especially in crystallization.

484. Particular terms have been applied to particular cases of solution.

485. The solution of a fluid in the atmosphere is termed *spontaneous evaporation*. It is promoted by exposing a large surface, by frequently renewing the air in contact with the surface, and by increase of temperature.

486. Some solids have so strong an affinity for water, that they attract it from the atmosphere in sufficient quantity to dissolve them. These are said to *deliquesce*. Others, on the contrary, retain their water of crystallization with so weak a force, that the atmosphere attracts it from them, so that they crumble into powder. These are said to *effloresce*. Both operations are promoted by exposing large surfaces, and by a current of air; but the latter is facilitated by a warm dry air, and the former by a cold humid atmosphere.

487. Solution is also employed to separate substances, (for example, saline bodies), which are soluble in the menstruum, from others which are not. When our object is to obtain the soluble substance in a state of purity, the operation is termed *lixivation* and as small a quantity of the menstruum as is possible is used. When, however, it is employed to free an insoluble substance from soluble impurities, it is termed *edulcoration*, which is best performed by using a very large quantity of the menstruum.

488. Organic products being generally composed of heterogeneous substances, are only partially soluble in the different menstua. To the solution of any of these substances, while the others remain undissolved, the term *extraction* is applied; and when, by evaporation, the substance extracted is reduced to a solid form, is termed an *Extract*, which is hard or soft, watery or spirituous.

according to the degree of consistency it acquires, and the nature of the menstruum employed.

489. *Infusion* is employed to extract the virtues of aromatic and volatile substances, which would be dissipated by decoction, and destroyed by maceration, and to separate substances of easy solution from others which are less soluble. The process consists in pouring upon the substance to be infused, placed in a proper vessel, the menstruum, either hot or cold, according to the direction, covering it up, agitating it frequently, and after a due time, straining or decanting off the liquor, which is now termed the Infusion.

490. *Maceration* differs from infusion, in being continued for a longer time, and can only be employed for substances which do not easily ferment or spoil.

491. *Digestion*, on the other hand, differs from maceration only in the activity of the menstruum being promoted by a gentle degree of heat. It is commonly performed in a glass matrafs, which should only be filled one third, and covered with a piece of wet bladder, pierced with one or more small holes, so that the evaporation of the menstruum may be prevented as much as possible, without risk of bursting the vessel. The vessel may be heated, either by means of the sun's rays, of a common fire, or of the sand-bath; and when the last is employed, the vessel should not be sunk deeper in the sand than the portion that is filled. Sometimes when the menstruum employed is valuable, a distilling apparatus is used to prevent any waste of it. At other times, a blind capital is luted on the matrafs, or a smaller matrafs is inverted within a larger one; and as the vapour which arises is condensed in it, and runs back into the larger, the process in this form has got the name of *Circulation*.

492. *Decoction* is performed by subjecting the substances operated on to a degree of heat which is sufficient to convert the menstruum into vapour, and can only be employed with advantage for extracting principles which are not volatile, and from substances whose texture is so dense and compact as to resist the less active methods of solution. When the menstruum is valuable, that portion of it which is converted into vapour, is generally saved by condensing it in a distilling apparatus, (441.)

493. Solutions in alcohol are termed *Tinctures*, and in vinegar or wine, *Medicated vinegars* or *wines*. The solution of metals in mercury is termed *Amalgamation*. The combinations of other metals with each other form *Alloys*.

494. *Absorption* is the condensation of a gas into a fluid or solid form, in consequence of its combination with a fluid or solid. It is facilitated by increase of surface and agitation; and the power of absorption in fluids is much increased by compression and di-

minution of temperature, although in every instance it be limited and determinate. Dr. Nooth invented an ingenious apparatus for combining gases with fluids, and Messrs. Schweppe, Henry, Paul, and Cuthbertson, have very advantageously employed compression.

495. Fluids often become solid by entering into combination with solids, and this change is always accompanied by considerable increase of temperature, as in the slaking of lime.

DECOMPOSITION.

496. *Decomposition* is the separation of bodies which were chemically combined.

497. It can only be effected by the agency of substances possessing a stronger affinity for one or more of the constituents of the compound, than these possess for each other.

498. Decomposition has acquired various appellations, according to the phenomena which accompany it.

499. *Dissolution* differs from solution in being accompanied by the decomposition, or a change in the nature of the substance dissolved. Thus, we correctly say, a solution of lime in muriatic acid, and a dissolution of chalk in muriatic acid:

500. Sometimes a gas is separated during the action of bodies on each other. When this escapes with considerable violence and agitation of the fluid, it is termed *effervescence*. The gas is very frequently allowed to escape into the atmosphere, but at other times is either collected in a pneumatic apparatus, or made to enter into some new combination. The vessels in which an effervescing mixture is made, should be high and sufficiently large, to prevent any loss of the materials from their running over, and in some cases the mixture must be made slowly and gradually.

501. *Precipitation* is the reverse of solution. It comprehends all those processes in which a solid is obtained by the decomposition of a solution. The substance separated is termed a *Precipitate*, if it sink to the bottom of the fluid; or a *Cream*, if it swim above it. Precipitation, like solution, is performed either *viâ humidâ*, or *viâ siccâ*, (479.)

502. The objects of precipitation are,

1. The separation of substances from solutions in which they are contained.
2. The purification of solutions from precipitable impurities.
3. The formation of new combinations.

503. Precipitation is effected,

1. By lessening the quantity of the solvent by evaporation.

2. By diminishing its solvent power, as by reduction of temperature, or dilution,
3. Or by the addition of some chemical agent, which from its more powerful affinities,
 - a. Either combines with the solvent, and precipitates the solvent;
 - b. Or forms itself an insoluble compound with some constituent of the solution.

504. The two first means of precipitation have been already noticed. Indeed they are rarely considered as instances of precipitation, as the effect is gradual, and the precipitated matter most commonly assumes determinate figures.

505. In performing it in the last manner, we may observe the following rules:

1. The solution and precipitant must possess the requisite degree of purity.
2. The solution should be perfectly saturated, to avoid unnecessary expenditure of the solvent or precipitant.
3. The one is to be added slowly and gradually to the other.
4. After each addition, they are to be thoroughly mixed by agitation.
5. We must allow the mixture to settle, after we think that enough of the precipitant has been added, and try a little of the clear solution, by adding to it some of the precipitant; if any precipitation takes place, we have not added enough of the precipitant. This is necessary, not only to avoid loss, but in many instances, the precipitant, if added in excess, re-dissolves or combines with the precipitate.

506. After the precipitation is completed, the precipitate is to be separated from the supernatant fluid by some of the means already noticed.

507. When the precipitate is the chief object of our process, and when it is not soluble in water, it is often advisable to dilute, to a considerable degree, both the solution and precipitant, before performing the operation. When it is only difficultly soluble, we must content ourselves with washing the precipitate, after it is separated by filtration. In some cases the separation of the precipitate is much assisted by a gentle heat.

508. *CrySTALLIZATION* is a species of precipitation, in which the particles of the solvent, on separating from the solution, assume certain determinate forms.

509. The conditions necessary for crystallization are,

1. That the integrant particles have a tendency to arrange themselves in a determinate manner, when acted on by the attraction of aggregation.
2. That they be disaggregated, at least so far as to possess sufficient mobility to assume their peculiar arrangement.
3. That the causes disaggregating them be slowly and gradually removed.

510. Notwithstanding the immense variety in the forms of crystals, M. Haüy has rendered it probable, that there are only three forms of the integrant particles :

1. The parallelopiped.
2. The triangular prism.
3. The tetrahedron.

511. But as these particles may unite in different ways, either by their faces or edges, they will compose crystals of various forms.

512. The primitive forms have been reduced to six :

1. The parallelopiped.
2. The regular tetrahedron.
3. The octahedron with triangular faces.
4. The six-sided prism.
5. The dodecahedron terminated by rhombs.
6. The dodecahedron with isosceles triangular faces.

513. Almost all substances, on crystallizing, retain a portion of water combined with them, which is essential to their existence as crystals, and is therefore denominated Water of crystallization. Its quantity varies very much in different crystallized substances.

514. The means by which the particles of bodies are disaggregated, so as to admit of crystallization, are solution, fusion, vaporization, or mechanical division and suspension in a fluid medium.

515. The means by which the disaggregating causes are removed, are, evaporation, reduction of temperature, and rest.

516. When bodies are merely suspended in a state of extreme mechanical division, nothing but rest is necessary for their crystallization.

517. When they are disaggregated by fusion or vaporization, the regularity of their crystals depends on the slowness with which their temperature is reduced ; for if cooled too quickly, their particles have not time to arrange themselves, and are converted at once into a confused or unvaried solid mass. Thus glass, which,

when cooled quickly, is so perfectly uniform in its appearance, when cooled slowly, has a crystalline texture. But in order to obtain crystals by means of fusion, it is often necessary, after the substance has begun to crystallize, to remove the part which remains fluid, for otherwise it would fill up the interstices among the crystals first formed, and give the whole the appearance of one solid mass. Thus, after a crust has formed on the top of melted sulphur, by pouring off the still fluid part, we obtain regular crystals.

518. The means by which bodies, which have been disaggregated by solution, are made to crystallize most regularly, vary according to the habitudes of the bodies with their solvents and caloric.

519. Some saline substances are much more soluble in hot than in cold water; therefore, a boiling saturated solution of any of these will deposit, on cooling, the excess of salt, which it is unable to dissolve when cold. These salts commonly contain much water of crystallization.

520. Other salts are scarcely, if at all, more soluble in hot than in cold water; and therefore their solutions must be evaporated, either by heat, or spontaneously. These salts commonly contain little water of crystallization.

521. The beauty and size of the crystals depend upon the purity of the solution, its quantity, and the mode of conducting the evaporation and cooling.

522. When the salt is not more soluble in hot than in cold water, by means of gentle evaporation a succession of pellicles are formed on the top of the solution, which either are removed, or permitted to sink to the bottom by their own weight; and the evaporation is continued until the crystallization be completed.

523. But when the salt is capable of crystallizing on cooling, the evaporation is only continued until a drop of the solution, placed upon some cold body, shews a disposition to crystallize, or at farthest only until the first appearance of a pellicle. The solution is then covered up, and set aside to cool, and the more slowly it cools, the more regular are the crystals. The mother-water, or solution which remains after the crystals are formed, may be repeatedly treated in the same way as long as it is capable of furnishing any more salt.

524. When very large and beautiful crystals are wanted, they may be obtained by laying well-formed crystals in a saturated solution of the same salt, and turning them every day. In this way their size may be considerably increased, though not without limitation, for after a certain time they grow smaller instead of larger.

525. Crystallization is employed,

1. To obtain crystallizable substances in a state of purity.
2. To separate them from each other, by taking advantage of their different solubility at different temperatures.

OXYGENIZEMENT.

526. The combination of oxygen is the object of many chemical and pharmaceutical processes.

527. With regard to the manner of combination, the oxygenizement may take place either

- a. Without the production of heat and light, to express which there is no other than the generic term *oxygenizement*; or
- b. With the production of heat and light, *combustion*.
 1. In substances which remain fixed at the temperature necessary for their combustion, there is no other more specific term.
 2. In substances which exist as gases, or are previously reduced to the state of vapour by the temperature necessary, it is termed *inflammation*; and if it proceed with very great violence and rapidity, *deflagration*.

528. Combustion and inflammation have been already described.

529. *Deflagration*, from its violence, must always be performed with caution. The common mode of conducting this process is, to introduce the substances to be deflagrated together into any convenient vessel, commonly an iron pot, or crucible, heated to redness. But to obviate any inconvenience, and to ensure the success of the process, they are previously made perfectly dry, reduced to powder, and thoroughly mixed together, and they are deflagrated gradually, for example, by spoonfuls; but we must take care always to examine the spoon, lest a spark should adhere to it, which might set fire to the whole mass. During the process, the portion introduced should be frequently stirred.

530. The oxygen necessary for the processes may be derived from the decomposition

- a. Of oxygen gas, or atmospheric air.
- b. Of oxides, particularly water.
- c. Of acids and their combinations, especially the oxygenized muriatic and nitric acids.

531. The different modes of oxygenizement are intended either

- a. To produce heat and light.
- b. To obtain an oxygenized product:
 - 1. An oxide, when the process may be termed *Oxidizement*.
 - 2. An acid, *Acidification*.
- c. To remove an oxygenizable substance.

532. Hydrogen, carbon, and nitrogen, are never, unless for experiment, oxygenized as simple substances.

533. Sulphur is converted into sulphuric acid by burning it in leaden chambers, or by deflagrating it with nitrate of potash; and phosphorus is acidified by inflammation in the atmosphere.

534. Of all the simple oxygenizable substances, the metals are most frequently combined with oxygen; and as in consequence of this combination they lose their metallic appearance, they were formerly said to be calcined or corroded.

535. Metals differ very much in the facility with which they are oxygenized by the contact of oxygen gas. For some, as iron and manganese, the ordinary temperature of the atmosphere is sufficient; others, as gold and platinum, scarcely undergo any change in the most violent heat. The operation is performed by heating them to the requisite temperature, and exposing them to the action of the air; and on the fusible metals it is promoted by stirring them when melted.

536. Metals also differ in the mode of their action upon water. They are either capable of decomposing water,

- a. At ordinary temperatures, as iron, zinc, manganese, &c.
- b. At elevated temperatures, as antimony and tin; or,
- c. When acted upon at the same time by an acid or an alkali, as copper, lead, bismuth; or, lastly,
- d. They are incapable of decomposing it, as gold, silver, mercury, platinum.

537. The oxygenizement of metals by water is promoted by the action of air. Iron, for example, is more quickly rusted by being merely moistened with water, than when totally immersed in water.

533. But the acids are the most powerful agents in oxygenizing metals. They do it in two ways, either

- 1. By enabling them to decompose water.
- 2. By being decomposed themselves.

539. Sulphuric acid is decomposed by very few metals, unless assisted by considerable increase of temperature; but it powerfully promotes the decomposition of water.

540. Nitric acid is decomposed by many of them with very great violence, proceeding in some instances even to inflammation. It also oxygenizes them to the highest degree of which they are susceptible. It seldom produces the decomposition of water.

541. Muriatic acid is never decomposed, and only acts on those metals capable of decomposing water.

542. Oxygenized muriatic acid resembles the nitric, both in the violence of its action, and in the extent to which it carries the oxygenizement of the metals.

543. The metals are susceptible of different degrees of oxygenizement, some of them even of acidification, and, in general, they are more oxygenized according to the rapidity of the process. When proceeding too slowly, it may be accelerated by heat; when too violent, it must be checked by diminution of temperature, as by plunging the vessel in which the operation is performing into cold water.

544. When the degree of oxygenizement is not very great, the oxide formed generally enters into combination with the acid employed, and forms a metallic salt; but when carried to its highest degree, the oxide is often insoluble.

DISOXYGENIZEMENT OF METALLIC OXIDES AND ACIDS.

545. This process was formerly termed *reduction*, from its restoring them to their metallic splendour, and is performed by causing some body to act upon them, which has a greater affinity for oxygen than they have. The different metals themselves vary very much in the degree of this affinity, so that they are reduced with very different degrees of facility. Gold, silver, platinum, and mercury, are reduced by merely exposing them to a sufficient degree of heat in close vessels. The oxygen at this temperature has a greater affinity for caloric than for the metals, and is therefore driven off in the form of very pure oxygen gas.

546. The other metallic oxides which resist the simple action of heat, may be reduced by melting them in contact with charcoal, or substances which may be charred, such as oil, fat, rosin, pitch, &c. Besides the charcoal, different saline fluxes are also added to facilitate the fusion of the oxide.

547. The oxide to be reduced is mixed with a sufficient quantity of any of these substances, and placed in the bottom of a crucible, which is afterwards filled up with charcoal powder, to pre-

vent entirely the access of the air, and exposed for a length of time to a sufficiently high temperature, when a button of the metal will commonly be found in the bottom of the crucible. Upon the volatile metals, such as arsenic and zinc, this operation must be performed in a distilling or subliming apparatus. Some metallic oxides, such as those of platinum, columbium, &c. cannot be reduced, from our being unable to produce a degree of heat sufficient to melt them.

548. Metals may be also obtained from the metallic salts, by inserting in a solution of these a plate of another metal, possessing a stronger affinity for oxygen and for the acid. Thus copper is precipitated by iron, and arsenic by zinc. We must only take care that the two metals have no remarkable affinity for each other, as in that case an alloy is commonly produced. For example, when mercury is placed in a solution of silver, a crystallized amalgam of silver is obtained, formerly called the Arbor Dianæ.

549. The compound oxides may be further oxygenized, by treating them with nitric acid. In this way various oxides and acids are formed, according to the nature of the oxide operated on, the quantity of the acid, and the mode of conducting the process.

550. They also undergo changes by gradually combining with the oxygen of the atmosphere. In some cases, this combination is attended with remarkable phenomena, which have been classed under the term *fermentation*.

551. There are several species of fermentation, which have been named from the products they afford.

1. The saccharine, which produces sugar.
2. The vinous, which produces wine, beer, and similar fluids.
3. The panary, which produces bread.
4. The acetous, which produces vinegar.
5. The putrefactive, which produces ammonia.

552. The same substances are sometimes capable of undergoing the first, second, fourth, and fifth; or third, fourth, and fifth, successively, but never in a retrograde order.

553. The conditions necessary for all of them are,

1. The presence of a sufficient quantity of fermentable matter.
2. The presence of a certain proportion of water.
3. The contact of atmospheric air; and,
4. A certain temperature.

554. *The saccharine fermentation*.—The seeds of barley, when

moistened with a certain quantity of water, and exposed to the contact of the atmospheric air, at a temperature of not less than 50° , swell, and shew marks of incipient vegetation, by pushing forth the radicle. If at this period the fermentation be checked, by exposing them to a considerable degree of heat, and drying them thoroughly, the insipid amylaceous matter, of which the seeds principally consisted, will be found to be changed in part into a sweet saccharine substance. The oxygen of the air, in contact with the seeds, is at the same time converted into carbonic acid gas, by combining with part of the carbon of the seeds; and there is a considerable increase of temperature in the fermenting mass, even to such a degree as sometimes to set it on fire. Similar phenomena occur in the maturation of fruits, in the cookery of some roots and fruits, and during the heating of hay, when put up too wet.

555. *The vinous fermentation.*—The conditions necessary for the vinous fermentation, are the presence of proper proportions of sugar, acid, extract, and water, and a temperature of about 70° . When these circumstances exist, an intestine motion commences in the fluid; it becomes thick and muddy, its temperature increases, and carbonic acid gas is evolved. After a time the fermentation ceases, the feces rise to the top, or subside to the bottom, the liquor becomes clear, it has lost its saccharine taste and assumed a new one, and its specific gravity is diminished. If the fermentation has been complete, the sugar is entirely decomposed, and the fermented liquor consists of a large proportion of water, of alcohol, of malic acid, of extract, of essential oil, and colouring matter. The substances most commonly subjected to this fermentation are must, which is the expressed juice of the grape, and which produces the best wines; the juice of the currant and gooseberry, which, with the addition of sugar, form our home-made wines; the juices of the apple and pear, which give cyder and perry; and an infusion of malt, which, when fermented with yeast, forms beer. The briskness and sparkling of some of these liquors depends on their being put into close vessels before the fermentation is completed, by which means a portion of carbonic acid gas is retained.

556. *The acetous fermentation.*—All vinous liquors are susceptible of the acetous fermentation, provided they be exposed to the action of the atmosphere, in a temperature not less than 70° . An intestine motion and hissing noise sensibly take place in the fluid, it becomes turbid, with filaments floating in it, and its temperature increases, it exhales a pungent acid smell, without any disengagement of carbonic acid gas. Gradually these phenomena cease; the temperature decreases, the motion subsides, and the liquor becomes clear, having deposited a sediment and red glairy

matter, which adheres to the sides of the vessel. During this process, the alcohol and malic acid disappear entirely, oxygen is absorbed, and acetous acid formed.

557. *The panary and colouring fermentation*—is less understood than those already described. A paste of wheat flour and water, exposed at a temperature of 65° , swells, emits a small quantity of gas, and acquires new properties. The gluten disappears, and it acquires a sour disagreeable taste. If a just proportion of this fermented paste or leaven, or what is still better, if some barm be formed into a paste with wheat-flour and water, the same fermentation is excited, without the disagreeable taste being produced; the gas evolved is prevented from escaping by the viscosity of the paste, which therefore swells, and if baked, forms light spongy bread.

558. *The putrefactive fermentation*.—Although vegetable substances, when they are destroyed by spontaneous decomposition, are said to putrify, we shall consider this fermentation as belonging exclusively to animal substances, or those which contain nitrogen as an elementary principle. The essential conditions of putrefaction are humidity, and a temperature between 45° and 110° . The presence of air, the diminution of pressure, and the addition of ferments, are not essential, but accelerate its progress. The matter is at first insipid and disagreeable, but afterwards insupportably fetid, although the fetor, for a time, is somewhat diminished by the mixture of an ammoniacal odour. Liquids become turbid and flocculent. Soft substances melt down into a gelatinous mass, in which there is a kind of gentle motion and swelling up, from the slow and scanty formation of elastic fluids. Solids, besides the general softening, exude a serosity of various colours, and by degrees the whole mass dissolves, the swelling ceases, the matter settles, and its colour deepens; at last its odour becomes somewhat aromatic, its elements are finally dissipated, and there remains only a kind of fat, viscid, and still fetid mould. The products of putrefaction are carburetted, sulphuretted, and phosphuretted hydrogen gases, water, ammonia, azote, and carbonic acid. These are all dissipated in the form of gas or vapour. When in contact with air, oxygen is absorbed. Acetic acid, a stinky matter, a soap composed of this fat and ammonia, and often the nitric acid, fixed by a salifiable base, are also produced; and the ultimate remains, besides salts, composed of acid and earths, contain for a long time a portion of fat stinky matter.

APPENDIX.

TABLES OF SIMPLE AFFINITY.

OXYGEN.	OXYGEN. <i>a.</i>	NITROGEN.	Arsenic, Molybdenum.
Carbon, Charcoal, Manganese, Zinc, Iron, Tin, Antimony, Hydrogen, Phosphorus, Sulphur, Arsenic, Nitrogen, Nickel, Cobalt, Copper, Bismuth, Caloric? Mercury, Silver, Arsenious acid, Nitric oxide, Gold, Platinum, Carbonic oxide, Muriatic acid, White oxide of manganese, White oxide of lead.	Titanium, Manganese, Zinc, Iron, Tin, Uranium, Molybdenum, Tungsten, Cobalt, Antimony, Nickel, Arsenic, Chromium, Bismuth, Lead, Copper, Tellurium, Platinum, Mercury, Silver, Gold.	Oxygen, Sulphur? Phosphorus; Hydrogen.	POTASS, SODA AND AMMONIA.
		HYDROGEN.	<i>Acids.</i> Sulphuric — Nitric, — Muriatic, — Phosphoric, — Fluoric, — Oxalic, — Tartaric, — Arsenic, — Succinic, — Citric, — Lactic, — Benzoic, — Sulphurous
		SULPHUR. PHOSPHORUS?	— Acetic, — Mucic, — Boracic, — Nitrous, — Carbonic, — Prussic, Oil, Water, Sulphur.
	CARBON.	Potass, Soda, Iron, Copper, Tin, Lead, Silver, Bismuth, Antimony, Mercury,	
	Oxygen, Iron, Hydrogen.		

a. Vauquelin's Table of the affinity of the metals for oxygen, according to the difficulty with which their oxides are decomposed by heat.

TABLES OF SIMPLE AFFINITY CONTINUED.

BARYTA.	<i>Acids.</i> Succinic,	MAGNESIA.	<i>Acids.</i> Phosphoric
	— Acetic, — Arsenic, — Boracic, — Carbonic, Water.		— Lactic, — Benzoic, — Acetic, — Boracic, — Sulphurous, — Nitrous, — Carbonic, — Prussic.
<i>Acids.</i> Sulphuric, — Oxalic, — Succinic, — Fluoric, — Phosphoric, — Mucic, — Nitric, — Muriatic, — Suberic, — Citric, — Tartaric, — Arsenic, — Lactic, — Benzoic, — Acetic, — Boracic, — Sulphurous, — Nitrous, — Carbonic, — Prussic, Sulphur, Phosphorus, Water, Fixed oil.	LIME. <i>Acids.</i> Oxalic, — Sulphuric, — Tartaric, — Succinic, — Phosphoric, — Mucic, — Nitric, — Muriatic, — Suberic, — Fluoric, — Arsenic, — Lactic, — Citric, — Malic, — Benzoic, — Acetic, — Boracic, — Sulphurous, — Nitrous, — Carbonic, — Prussic, Sulphur, Phosphorus, Water, Fixed oil.	<i>Acids.</i> Oxalic, — Phosphoric, — Sulphuric, — Fluoric, — Arsenic, — Mucic, — Succinic, — Nitric, — Muriatic, — Tartaric, — Citric, — Malic, — Lactic, — Benzoic, — Acetic, — Boracic, — Sulphurous, — Nitrous, — Carbonic, — Prussic, Sulphur.	SILICA. Fluoric acid, Potass. OXIDE OF PLATINUM. OXIDE OF GOLD. <i>a.</i> Gallic acid, Muriatic, Nitric, Sulphuric, Arsenic, Fluoric, Tartaric, Phosphoric, Oxalic, Citric, Acetic, Succinic, Prussic, Carbonic, Ammonia.
STRONTIA.		ALUMINA.	
<i>Acids.</i> Sulphuric, — Phosphoric, — Oxalic, — Tartaric, — Fluoric, — Nitric, — Muriatic,		<i>Acids.</i> Sulphuric, — Nitric, — Muriatic, — Oxalic, — Arsenic, — Fluoric, — Tartaric, — Succinic, — Mucic, — Citric,	

a. Omitting the oxalic, citric, succinic, and carbonic, and adding sulphuretted hydrogen after ammonia.

TABLES OF SIMPLE AFFINITY CONTINUED.

OXIDE OF SILVER.	Boracic, Prussic, Carbonic.	Phosphoric, Succinic, Fluoric, Citric, Lactic, Acetic, Boracic, Prussic, Carbonic, Fixed alkalies, Ammonia, Fixed oils.	Muriatic, Nitric, Phosphoric, Arsenic, Fluoric, Succinic, Citric, Lactic, Acetic, Boracic, Prussic, Carbonic.
Gallic acid, Muriatic, Oxalic, Sulphuric, Mucic, Phosphoric, Sulphurous, Nitric, Arsenic, Fluoric, Tartaric, Citric, Lactic, Succinic, Acetic, Prussic, Carbonic, Ammonia.	OXIDE OF LEAD.		
	Gallic, Sulphuric, Mucic, Oxalic, Arsenic, Tartaric, Phosphoric, Muriatic, Sulphurous, Suberic, Nitric, Fluoric, Citric, Malic, Succinic, Lactic, Acetic, Benzoic, Boracic, Prussic, Carbonic, Fixed oils, Ammonia.	OXIDE OF ARSENIC.	OXIDE OF TIN. <i>a</i> .
OXIDE OF MERCURY.		Gallic, Muriatic, Oxalic, Sulphuric, Nitric, Tartaric, Phosphoric, Fluoric, Succinic, Citric, Acetic, Prussic, Fixed alkalies, Ammonia, Fixed oils, Water.	Gallic, Muriatic, Sulphuric, Oxalic, Tartaric, Arsenic, Phosphoric, Nitric, Succinic, Fluoric, Mucic, Citric, Lactic, Acetic, Boracic, Prussic, Ammonia.
Gallic acid, Muriatic, Oxalic, Succinic, Arsenic, Phosphoric, Sulphuric, Mucic, Tartaric, Citric, Malic, Sulphurous, Nitric, Fluoric, Acetic, Benzoic,	OXIDE OF COPPER.	OXIDE OF IRON.	OXIDE OF ZINC.
	Gallic, Oxalic, Tartaric, Muriatic, Sulphuric, Mucic, Nitric, Arsenic,	Gallic, Oxalic, Tartaric, Camphoric, Sulphuric, Mucic,	Gallic, Oxalic, Sulphuric, Muriatic, Mucic,

a. Bergmann places the tartaric before the muriatic.

TABLES OF SIMPLE AFFINITY CONTINUED.

Nitric, Tartaric, Phosphoric, Citric, Succinic, Fluoric, Arsenic, Lactic, Acetic, Boracic, Prussic, Carbonic, Fixed alkalies, Ammonia.	SULPHURIC ACID. PRUSSIC. <i>a</i> .	PHOSPHORIC ACID. CARBONIC. <i>c</i> .	Soda, Strontia, Lime, Magnesia, Ammonia, Glucina, Alumina, Zirconia, Metallic oxides.
OXIDE OF ANTIMONY.	Baryta, Strontia, Potass, Soda, Lime, Magnesia, Ammonia, Glucina, Gadolina, Alumina, Zirconia, Metallic oxides.	Baryta, Strontia, Lime, Potass, Soda, Ammonia, Magnesia, Glucina, Alumina, Zirconia, Metallic oxides, Silica.	FLUORIC ACID BORACIC — <i>e</i> . ARSENIC — <i>f</i> . TUNGSTIC —
Gallic, Muriatic, Benzoic, Oxalic, Sulphuric, Nitric, Tartaric, Mucic, Phosphoric, Citric, Succinic, Fluoric, Arsenic, Lactic, Acetic, Boracic, Prussic, Fixed alkalies. Ammonia,	SULPHUROUS ACID. SUCCINIC. <i>b</i> .	PHOSPHOROUS ACID.	Lime, Baryta, Strontia, Magnesia, Potass, Soda, Ammonia, Glucina, Alumina, Zirconia, Silica.
	Baryta, Lime, Potass, Soda, Strontia, Magnesia, Ammonia, Glucina, Alumina, Zirconia, Metallic oxides.	Lime, Baryta, Strontia, Potass, Soda, Ammonia, Glucina, Alumina, Zirconia, Metallic oxides	ACETIC ACID. LACTIC — SUBERIC — <i>g</i> .
		NITRIC ACID. MURIATIC — <i>d</i> .	Baryta, Potass, Soda, Strontia,
		Baryta, Potass,	

a. With the omission of all after ammonia.

b. Ammonia should come before magnesia, and strontia, glucina, and zirconia should be omitted.

c. Magnesia should stand above ammonia, and alumina and silica should be omitted.

d. Ammonia should stand above magnesia.

e. Silica should be omitted, and instead of it water and alcohol be inserted.

f. Except silica.

g. With the omission of strontia, metallic oxides, glucina and zirconia.

TABLES OF SIMPLE AFFINITY, CONTINUED.

Lime, Ammonia, Magnesia. Metallic oxides, Glucina, Alumina, Zirconia.	BENZOIC ACID.	FIXED OIL.	SULPHURETTED HYDROGEN.
	White oxide of arsenic, Potafs, Soda, Ammonia, Baryta, Lime, Magnesia, Alumina.	Lime, Baryta, Potafs, Soda, Magnesia, Oxide of Mer- cury, Other metallic oxides, Alumina.	Baryta, Potafs, Soda, Lime, Ammonia, Magnesia, Zirconia.
OXALIC ACID. TARTARIC— CITRIC — ^a .			
Lime, Baryta, Strontia, Magnesia, Potafs, Soda, Ammonia, Alumina, Metallic oxides, Water, Alcohol.	CAMPHORIC ACID. Lime, Potafs, Soda, Baryta, Ammonia, Alumina, Magnesia.	ALCOHOL. Water, Ether, Volatile oil, Alkaline Sul- phurets.	

^a Zirconia after alumina.

CASES OF MUTUAL DECOMPOSITION.

1. From Simple Affinity. (20. a.)

Sulphate of Potass,	with	Muriate of Baryta.
Soda,	—	Nitrate of Potass.
Ammonia,	—	Muriate of Soda.
Magnesia,	—	Carbonate of Potass.
Super-sulphate of Alumina,	—	Muriate of Lime.
Nitrate of Potass,	—	Baryta.
Ammonia,	—	Phosphate of Soda.
Muriate of Baryta,	—	All the Sulphates and Ni-
		trates.
Soda,	—	Carbonate of Potass.
Lime,	—	Sub-borate of Soda.
Ammonia,	—	Carbonate of Potass.
Phosphate of Soda,	—	Muriate of Ammonia.
Sub-borate of Soda,	—	Carbonate of Potass.
Nitrate of Silver,	—	Muriate of Soda.
Acetate of Lead,	—	Citrate of Potass.
Sulphate of Mercury,	—	Muriate of Soda.
Soap of Potass,	—	Muriate of Soda.
Soap of Soda,	—	Sulphate of Lime.

2. From Compound Affinity. (20. b.)

Sulphate of Baryta,	with	Carbonate of Potass.
Sulphate of Baryta,	—	Soda.
Potass,	—	Muriate of Lime.
Soda,	—	Muriate of Lime.
Muriate of Baryta,	—	Phosphate of Soda.
	—	Sub-borate of Soda.
	—	Carbonate of Potass.
	—	Soda.
	—	Ammonia.
Muriate of Lime,	—	Carbonate of Ammonia.
Phosphate of Soda,	—	Lime.
Acetate of Lead,	—	Sulphate of Zinc.
Acetate of Lead,	—	Nitrate of Mercury.

CASES OF DISPOSING AFFINITY. (20. c.)

The formation of water by the action of the sulphuric acid on the compound oxides.

The oxidation of metals by water, in consequence of the presence of an acid.

THERMOMETERS.

Fahrenheit's thermometer is universally used in this kingdom. In it the range between the freezing and boiling points of water is divided into 180 degrees; and as the greatest possible degree of cold was supposed to be that produced by mixing snow and muriate of soda, it was made the zero, and the freezing point became 32°, and the boiling point 212°.

The centigrade thermometer of Revolutionized France, places the zero at the freezing point, and divides the range between it and the boiling point into 100°. This has long been used in Sweden under the title of Celsius's thermometer.

Reaumur's thermometer, which was formerly used in France, divides the space between the freezing and boiling of water into 80°, and places the zero at the freezing point.

Wedgewood's pyrometer is only intended to measure very high temperatures. Its zero corresponds with 1077° of Fahrenheit's, and each degree of Wedgewood is equal to 130 of Fahrenheit.

$$\text{Therefore } 180^{\circ} \text{ F.} = 100^{\circ} \text{ C.} = 80^{\circ} \text{ R.} = \frac{28}{13} \text{ W.}$$

Or to reduce centigrade degrees to those of Fahrenheit, multiply by 9 and divide by 5, and to the quotient add 32, that is,
 $\frac{9 \text{ C}}{5} + 32 = \text{F.}$

To reduce Reaumur's to Fahrenheit's, we have the following formula, $\frac{9 \text{ R}}{4} + 32 = \text{F.}$

To reduce Wedgewood's degrees to those of Fahrenheit, we have $130 \text{ W} + 1077 = \text{F.}$

Or inversely,

$$\frac{5 \text{ F} - 160}{9} = \text{C.}, \quad \frac{4 \text{ F} - 128}{9} = \text{R.}, \quad \frac{\text{F.} - 1077}{130} = \text{W.}$$

TABLE of the Degrees of different Thermometers, omitting Fractions, at which some remarkable Chemical Phenomena occur.

REAU.	FAHR.	CENT.	
—54	—90	—68	Cold produced by Mr. Walker.
—44	—66	—55	Nitric acid freezes, Fourcroy.
—36	—50	—44	Cold observed at Hudson's Bay, Mr. M'Nab.
—35	—46	—43	Ether freezes.
—34	—45	—42	Ammonia exists in a liquid form.
—32	—39	—39	Mercury freezes.
—30	—36	—37	Sulphuric acid freezes, (Thomson).
—28	—31	—35	Sulphurous acid liquid, (Monge).
—24	—23	—30	Cold observed at Glasgow on the surface of snow, 1780.
—23	—22	—30	Acetous acid freezes.
—20	—14	—25	Cold observed at Glasgow, 1780.
—19	—11	—24	Two parts of alcohol and one of water freeze.
—17	—7	—14	Brandy freezes.
—14	0	—18	Cold produced by mixing equal parts of snow and muriate of soda.
—7	16	—9	Oil of turpentine freezes, Margueron. Did not freeze at—18, Morelli.
—5	20	—6	Strong wines freeze.
—4	23	—5	Fluoric acid freezes, (Priestley). Oils of bergamot and cinnamon freeze, (Marg.)
—3	25	—4	Human blood freezes.
—2	28	—2.5	Vinegar freezes.
—1	30	—1.25	Milk freezes.
0	32	0	Oxymuriatic acid melts, (Thomson.) Water freezes.
2	36	2.5	Olive oil freezes.
4	40	5	Oxymuriatic acid boils, (Thomson.)— Equal parts of phosphorus and sulphur melt, (Pelletier).
5	43	6	Phosphorus burns slowly.
6	45		Sulphuric acid, specific gravity 1.78, freezes, (Keir).
10	55	12	to 66 putrid fermentation, (Fourcroy).
12	59	15	Vinous fermentation begins, (Fourc.)

REAU.	FAHR.	CENT.	
14	64	17	Oil of anise freezes,
15	66	18	to 133, F. Animal putrefaction, to 70 panary fermentation.
16	68	20	Camphor evaporates, (Fourcroy).
19	75	24	Summer heat at Edinburgh.
20	77	25	Vinous fermentation rapid, (Fourcroy). Acetous ditto begins.
21	80	26	Phosphorus burns in oxygen gas. 104, Goëttling.
22	82	28	The adipocere of muscle melts.
25	88	31	Acetous fermentation ceases, (Fourc.) Phosphorus is ductile. F.
28	96	35	to 100, animal heat.
	97		Axunge melts, (Nicholson).
29	98	36	Ether boils.
30	99	37	Phosphorus melts, (Pelletier).
32	104	40	Resin of bile melts.
33	107	41	Feverish heat.
34	109	42	Myrtle wax melts, (Cadet).
36	112	45	Spermaceti melts, (Bostock).
40	122	50	Phosphorus burns vividly, (Fourcroy). 148, (Thomson).
42	127	53	Tallow melts, (Nicholson).
44	130	54	Ammonia is separated from water.
48	140	60	Ammonia boils, (Dalton).
49	142	61	Bees wax melts, (Irvine).
50	145	63	Camphor sublimes, (Venturi). Am- bergris melts, (La Grange).
55	155	79	Bleached wax melts, (Nicholson).
59	165	74	Albumen coagulates. 156, (Black).
61	170	77	Sulphur evaporates, (Kirwan).
64	176	80	Alcohol boils. 174, (Black).
90	235	116	Adipocere of biliary calculi melts, (Fourcroy).
80	212	100	Water and volatile oils boil.
			Bismuth 5 parts, tin 3, and lead 2, melt.
83	219	104	Phosphorus begins to distil, (Pelletier).
88	230	110	Muriate of lime boils, (Dalton).
89	234	111	Sulphur Melts, Hope. (212°, Four- croy). (185°, Kirwan).
93	242	116	Nitrous acid boils.
96	248	120	Nitric acid boils.

REAU.	FAHR.	CENT.	WED.	
112	283	140		White oxide of arsenic sublimes.
				Alloy of equal parts of tin and bismuth melts.
120	303	150		Sulphur burns slowly, and camphor melts, (Venturi).
134	334	168		Alloys, tin 3, and lead 2, and tin 2, bismuth 1, melt.
182	442	227		Tin melts, Crichton. (413, Irvine).
190	460	238		Tin 1, and lead 4, melt.
197	476	248		Bismuth melts, (Irvine).
226	540	282		Arsenic sublimes.
232	554	290		Phosphorus boils, (Pelletier).
235	560	294		Oil of turpentine boils;
248	590	310		Sulphuric acid boils, (Dalton). 546, Black. 540, Bergm.
252	600	315		Linseed oil boils. Sulphur sublimes, (Davy). 570, Thomson.
258	612	325		Lead melts, Crichton. (594, Irvine). 585, Secundar. (540, Newton).
269	635	335		Lowest ignition of iron in the dark.
279	660	350		Mercury boils, (Dalton). 644, Secundar. 600, Black.
297	700	371		Zinc melts.
315	750	384		Iron bright red in the dark
341	800	427		Hydrogen gas burns. 1000, Thomson.
342	802	428		Charcoal burns, (Thomson).
345	809	432		Antimony melts.
380	884	475		Iron red in the twilight.
448	1050	560		Iron red hot in a common fire.
462	1077	577	1	Red heat in day light.
564	1300	705	1.7+	Azotic gas burns.
737	1807	986	6	Enamel colours burnt.
1451	2897	1814	14	Diamond burns. 1, Sir G. M'Kenzie. 500, Morveau.
1678	3807	2100	21	Brass melts.
2024	4587	2530	27	Copper melts.
2082	4717	2602	28	Silver melts.
2130	4847	2700	29	Settling heat of plate glass.
2313	5237	2780	32	Gold melts.

REAU.	FAHR.	CENT.	WED.	
2880	6507	3580	40	Delft ware fired.
3750	8480	4680	57	Working heat of plate glafs.
4450	10177	5610	70	Flint glafs furnace.
5370	12257	6770	86	Cream coloured ftone ware fired.
5800	13297	7330	94	Worcefter china vitrified.
6270	14337	7850	102	Stoneware fired.
6520	14727	8150	105	Chelfea china vitrified.
6925	15637	8650	112	Derby.
7025	15897	8770	114	Flint glafs furnace greateft heat.
7100	16007	8880	121	Bow china vitrified.
			123	Equal parts of chalk and clay melt.
7466	16867	9320	124	Plate glafs furnace ftongeft heat.
7650	17327	9600	125	Smith's forge.
7975	17977	9850	130	Cobalt melts. Cast iron melts.
8250	18627	10320	135	Bristol china no vitrification at.
9131	20577	11414	150	Nickel melts. Heflian crucible melted.
9325	21097	11680	154	Soft iron nails melted with the crucible.
9602	21637	12001	158	Iron melts.
9708	21877	12136	160	Manganefe melts. Air furnace.
10280	23177	12857	170+	Platinum, tungften, molybdenum, uranium, and titanium, melt.
11106	25127	13900	185	Greateft heat obferved.

N. B. As many of thefe higher numbers were calculated from Wedgewood's, by the fliding rule, the two or three firft figures only can be depended upon as correct. They will be found however to be fufficiently accurate for moft purpofes.

TABLE OF FREEZING MIXTURES.

DURING the solution of many saline bodies, a very considerable reduction of temperature takes place. We shall extract from Mr. Walker's paper a few of the most convenient mixtures employed for this purpose.

<i>A mixture of]</i>		<i>[reduces the temperature</i>
Muriate of ammonia,	5 parts.	} from 50° to 10°.
Nitrate of potash,	5	
Water,	16	
Sulphate of soda,	8	} from 50° to 0°.
Muriatic acid,	5	
Snow,	1	} from 32° to 0°.
Muriate of soda,	1	
Snow,	2	} from 0° to —5°.
Muriate of soda,	1	
Snow,	1	} from —50° to 18°.
Muriate of soda,	5	
Muriate of ammonia, and	}	
Nitrate of potash,			5
Snow,	12	} from —18° to —25°.
Muriate of soda,	5	
Nitrate of ammonia,	5	
Snow,	1	} from 20° to —60°.
Diluted sulphuric acid,	1	
Snow,	2	} from 32° to —56°.
Muriate of lime,	3	
Snow,	1	} from —40° to —73°.
Muriate of lime,	3	
Snow,	8	} from —68° to —91°.
Diluted sulphuric acid,	10	

The salts ought to be recently crystallized, and reduced to a very fine powder, and the mixture should be made as quickly as possible. To produce a very great degree of cold, the materials must be previously cooled down by means of other mixtures.

TABLE of some GALVANIC CIRCLES, Composed of two Perfect Conductors, and one Imperfect Conductor, (Davy).

More oxygenizable substances.	Zinc,	Less oxygenizable substances.	with gold, charcoal, silver, copper, tin, iron, mercury.	Oxygenizing fluids.	Solutions of nitric acid, in water, of muriatic acid, sulphuric acid, &c. Water, holding in solution oxygen, atmospheric air.
	Iron,		— gold, charcoal, silver, copper, tin.		
	Tin,		— gold, silver, charcoal.		
	Lead,		— gold, silver.		
	Copper, Silver,		— gold, silver. — gold.		
					Solution of nitrates of silver, and mercury. Nitric acid, acetous acid. Nitric acid.

TABLE of some GALVANIC CIRCLES, Composed of two Imperfect Conductors, and one Perfect Conductor.

Perfect Conductors.	Charcoal, Copper, Silver, Lead, Tin, Iron, Zinc,	Imperfect Conductors.	Solutions of hydrogen-retted alkaline sulphurets, capable of acting on the first three metals, but not on the last three.	Imperfect Conductors.	Solutions of nitrous acid, oxygenized muriatic acid, &c. capable of acting on all the metals.
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WEIGHTS AND MEASURES.

“To employ, as the fundamental unity of all measures, a type taken from nature itself, a type as unchangeable as the globe on which we dwell,—to propose a metrical system, of which all the parts are intimately connected together, and of which the multiples and subdivisions follow a natural progression, which is simple, easy to comprehend:—this is most assuredly a beautiful, great, and sublime idea, worthy of the enlightened age in which we live.”

Such were the ideas which influenced the French National Institute, when they chose as the base of the whole metrical system, the fourth part of the terrestrial meridian between the equator and the north pole. They adopted the ten millionth part of this arc for the unity of measure, which they denominated *metre*, and applied it equally to superficial and solid measures, taking for the unity of the former the square of the decuple, and for that of the latter the cube of the tenth part of the *mètre*. They chose for the unity of weight, the quantity of distilled water which the same cube contains when reduced to a constant state presented by nature itself; and lastly, they decided that the multiples and sub-multiples of each kind of measure, whether of weight, capacity, surface, or length, should be always taken in the decimal progression, as being the most simple, the most natural, and the most easy, for calculation, according to the system of numeration which all Europe has employed for centuries.

By a careful measurement of the arc between Dunkirk and Mountjouy, they found the length of the metre to be equal to 443.296 lines of the toise of Peru. The cubic decimetre of distilled water, taken as its maximum of density and weight *in vacuo*, that is the unity of weight, was found to be 18827.15 grains of the pile of Charlemagne. By actual comparison, the metre was found to be equal to 39.371 English inches at 62°, the temperature universally employed in the comparison of English standards: and upon these data the following tables have been constructed.

TABLES OF WEIGHTS AND MEASURES.

Measures of Length; the Metre being at 320, and the foot at 62.

	English inches.						
Millimetre	==	.03937					
Centimetre	==	.39371					
Decimetre	==	3.93710					
Metre	==	39.37100	Mil.	Fur.	Yds	Feet.	Inch.
Decametre	==	393.71000	= 0	0	10	2	9.7
Hecatometre	==	3937.10000	= 0	0	109	1	1
Chiliometre	==	39371.00000	= 0	4	213	1	10.2
Myriometre	==	393710.00000	= 6	1	156	0	6.

Measures of Capacity,

	Cubic inches.					
Millilitre	==	.06103				
Centilitre	==	.61028				
Decilitre	==	6.10280				
Litre	==	61.02800				
Decalitre	==	610.28000				
Hecatolitre	==	6102.80000				
Chiliolitre	==	61028.00000				
Myriolitre	==	610280.00000				

				<i>English.</i>			
				Tons.	Hop.	Wine gall.	Pints.
				0	0	0.	2.113
				0	0	2.	5.135
				0	0	26.419	
				1	0	12.19	
				10	1	58.9	

Wine Measure.

Gallon.	Pints.	Ounces.	Drachms.	Cub. Inch.	Litres.
1	8	128	1024	231	3.7851
	1	16	128	28.875	0.4739
		1	8	1.8047	0.0295
			1	0.2256	0.0039

Measures of Weight.

		English grains.			
Milligramme	=	.0154			
Centigramme	=	.1544			
Decigramme	=	1.5444			
Gramme	=	15.4440			
Decagramme	=	154.4402			
Hecatogramme	=	1544.4023			
Chiliogramme	=	15444.0234			
Myriogramme	=	154440.2344			
			Avoirdupois.		
			Pound.	Oun.	Dram.
			=	0	0
			=	0	3
			=	2	3
			=	22	1

Troy Weight.

Pound.	Ounces.	Drachms.	Scruples.	Grains.	Grammes.
1	= 12	= 96	= 288	= 5760	= 372.96
	1	= 8	= 24	= 480	= 31.08
		1	= 3	= 60	= 3.885
			1	= 20	= 1.295
				1	= 0.06475

Avoirdupois Weight.

Pound.	Ounces.	Drachms.	Grains.	Grammes.
1	= 16	= 256	= 7000	= 453.25
	1	= 16	= 437.5	= 28.32
		1	= 27.975	= 1.81

Table of Specific Gravities corresponding to the degrees of Baume's hydrometer, 55° Fahrenheit.

For SPIRITS and Fluids lighter than Water.

SP. GR.		SP. GR.	
40	= 817	25	= 897
35	= 842	20	= 928
30	= 867	15	= 963

For SALTS and Fluids heavier than Water.

SPIRITS.	SP. GR.	SALTS.	SP. GR.	SALTS.
10	= 1000	= 0	1373	= 39
	1040	= 6	1455	= 45
9	= 1072	= 10	1547	= 51
	1089	= 12	1594	= 54
	1114	= 15	1717	= 60
	1170	= 21	1848	= 66
	1200	= 24	1920	= 69
	1261	= 30	2000	= 72
	1333	= 36		

Comparative Weights of Gaseous Fluids.

	100 CUBIC INCHES.		SPECIFIC GRAVITY.		
	French, in French grains.	English, in Troy grains.	Water.	Standard Air.	
Water	37419.8		1000.	813.5	L.
Ditto		25242.2	1000	814.3	S.
Atmospheric air	46.		1.2293	1.	L.
Ditto		31.	1.2279	1.	S.K.
Oxygen	51.		1.365	1.11	L.
Ditto		34.	1.35	1.09	K.
Ditto		35.09	1.39	1.13	D.
Nitrogen	44.44		1.19	0.965	L.
Ditto		30.535	1.21	0.985	K.
Ditto		30.45	1.20	0.98	D.
Ammonia		18.16	0.715	0.585	K.
Ditto		18.	0.713	0.58	D.
Hydrogen	3.5		0.0035	0.076	K.
Ditto		2.613	0.131	0.084	K.
Hydrocarbonous oxides		14.5	0.573	0.467	C.
		16.	0.632	0.516	C.
		20.	0.78	0.645	C.
		21.	0.83	0.677	C.
Carbonic oxide		30.	1.185	0.965	C.
Carbonic acid		46.5	1.84	1.5	K.
		45.5	1.802	1.47	D.
Nitrous oxide		50.1	1.985	1.615	D.
Nitric oxide		37.	1.465	1.193	K.
Ditto		34.3	1.36	1.105	D.
Nitric acid		76.	3.	2.425	D.
Sulphuretted hydrogen		34.286	1.36	1.205	K.
Sulphurous acid		70.215	2.75	2.24	K.
Muriatic acid	66.		1.765	1.43	B.

L. Lavoisier. S. Shuckburgh. K. Kirwan. D. Davie. C. Cruickshank. B. Briffon.

SOLIDS.

Diamond	-	3.5212	*Carbonate of soda,	1.7377
Native sulphur		2.0332	* ————— magnesia,	0.294
Melted do.	-	1.9907	Ambergris,	0.9263
Phosphorus	-	1.7140	Tallow,	0.9419
Platinum rolled,		22.0690	Hogs lard,	0.9478
Gold hammered,		19.3617	Yellow wax,	0.9648
Tungsten	-	17.6	White do.	0.9686
Mercury, at—40°		15.612	Spermaceti,	0.9433
Sulphuret of do.		10.	Rosin,	1.0727
Lead melted,	-	11.3523	Sandarac,	1.0920
Silver hammered,		10.5107	Mastich,	1.0742
Bismuth melted,		9.8227	Copal,	1.0452
Nickel do.	-	9.	Amber,	1.0780
Copper wire,	-	8.8785	Elemi,	1.0682
Cobalt,	-	8.5384	Labdanum,	1.1862
Arsenic	-	8.31	Resin of Guaiac,	1.2289
Arsenious acid,		3.706	Resin of jalap,	1.2185
Bar iron,	-	7.788	Dragons' blood,	1.2045
Cast iron.	-	7.207	Tacamahaca,	1.0463
Steel hardened,		7.8404	Benzoin,	1.0924
Molybdenum,	-	7.5	Storax,	1.1098
Tin hardened,		7.3065	Gum ammoniac,	1.2071
Zinc,	-	7.1908	Gamboge,	1.2216
Manganese,	-	7.	Olibanum,	1.1732
Antimony,	-	6.89	Myrrh,	1.3600
Sulphuret of do.		4.0643	Scammony,	1.2354
Glass of do.	-	4.9464	Galbanum,	1.2120
Uranium,	-	6.44	Sagapenum,	1.2008
Tellurium,	-	6.115	Opoponax,	1.6226
Collumbium,	-	5.918	Assafoetida,	1.3275
*Soda,	-	1.336	Hepatic aloes,	1.3586
*Strontia,	-	1.647	Socotorine aloes,	1.3795
*Sulphate of soda,		1.4457	Opium,	1.3366
* ————— magnesia,		1.6603	Gum arabic,	1.4523
*Muriate of lime,		1.7603	— tragalanth,	1.3161
* ————— baryta,		2.8257	Extract of liquorice,	1.7228
* ————— mercury,		5.1398	— catechu,	1.4573
*Sub-muriate of mercury,		7.1758	Sarcocoll,	1.2684
*Tartrate of potass,		1.5567	Camphor,	0.9887
* ————— soda,		1.7437	Caoutchouc,	0.9335
*Acetate of soda,		2.109	Indigo,	0.7690
* ————— lead,		2.345	Arnotto,	0.5956
* ————— iron,		1.398	Cork,	0.2400
*Phosphate of soda,		1.333		

FLUIDS.

Water,.....	1.0000	Sulphuric ether,.....	0.7394
Mercury,.....	13.5681	Nitrous ether,.....	0.9088
Sulphuric acid,.....	2.1250	Oil of turpentine,.....	0.8697
Nitric acid,.....	1.504	Volatile oil of lavender,.....	0.8938
Muriatic acid,.....	1.1940	————— cloves,.....	1.0363
Acetic do,.....	1.0135	————— cinnamon,.....	1.0439
Strong acetic do,.....	1.0626	Oil of olives,.....	0.9153
Carbonic acid,.....	1.0015	———— almonds,.....	0.9170
Water saturated with		Linseed oil,.....	0.9403
ammonia,.....	0.8970	Whale oil,.....	0.9233
Alcohol,.....	0.8293		

SALTS.

	H.	K.	M.	N.
Potash,.....	1.7085	4.6215		
Lime,.....	1.5233	2.3908	2.3700	
Magnesia,.....	0.3460	2.3298		
Alumina,.....	0.8200	2.0000		
Baryta,.....	2.3740	4.0000		
Sulphate of potash,.....	2.4073	2.636	2.398	
———— alumina,.....	1.7109		1.7260	1.714
———— zinc,.....	1.9120		1.9	1.712
———— iron,.....	1.8399		1.88	
———— copper,.....	2.1943	2.23		
Nitrate of potash,.....	1.9369	1.933	1.901	1.900
Muriate of soda,.....	2.2001		2.0835	2.143
Acetate of lead,.....	2.3450		2.3953	
Super-tartrate of potash,.....	1.9153		1.8745	
Sub-borate of soda,.....	1.7230		1.7170	1.714
Carbonate of potash,.....	2.0120		2.749	
———— soda,.....	1.3591	1.421		
———— ammonia,.....	0.9660	1.8245	1.5026	

H. Haffenfratz, K. Kirwan, M. Muschenbroeck, N. Newton. The very great dissimilarity of these estimations, shew how difficult it is to ascertain the specific gravity of soluble substances. Haffenfratz is the last who has paid particular attention to this subject; and as he is followed in the best systems of chemistry, I have inserted in the general table the salts examined by him only, although I must confess, that I have no confidence in his results, as they are frequently contradicted by obvious facts. For example, according to him magnesia is not half the weight of sulphuric ether, and yet it sinks in water: I have therefore distinguished these by an asterisk.

TABLE of the SOLUBILITY of Saline and other Substances, in 100 parts of Water, at the temperature of 60° and 212°

Acids.		
Sulphuric,	unlimited.	unlimited.
Nitric,	do.	do.
Acetic,	do.	do.
Prussic,	do.	do.
Phosphoric,	very soluble, proportion not determined.	
Acetic,		
Tartaric,		
Malic,		
Lactic,		
Laccic,		
Arsenic,	150	
Arsenious acid,	1.25	6.6
Citric,	133	200
Oxalic,	50	100
Gallic,	8.3	66
Boracic,		2
Mucic,	0.84	1.25
Succinic,	<div> 4 1.04 </div>	50
Suberic,	0.69	50
Camphoric,	1.04	8.3
Benzoic,	0.208	4.17
Molybdic,		0.1
Chromic, unknown.		
Tungstic, insoluble.		
Salifiable Bases.		
Potafs,	50	
Soda, very soluble, proportion not known.		
Baryta,	5	50
— crystallised,	57	any quantity.
Strontia,	0.6	
— crystallized,	1.9	50
Lime,	0.2	
Salts.		
Sulphate of potafs,	6.25	20
Super-sulphate of potafs,	50	100 +
Sulphate of soda,	37.4	125
— ammonia,	50	100

	Temperatures,	600	2120
Sulphate of magnesia,	100	133	
----- alumina, very soluble, proportion unknown.			
Super-sulphate of alumina and potass, } ----- ammonia, }	alum, 5	133	
Nitrate of baryta,	8	25	
----- potass,	14.25	100+	
----- soda,	33	100	
----- strontia,	100	200	
----- lime,	400	any quantity.	
----- ammonia,	50	200	
----- magnesia,	100	100+	
Muriate of baryta,	20		
----- potass,	33		
----- soda,	35.42	36.16	
----- strontia,	150	any quantity.	
----- lime,	200		
----- ammonia,	33	100	
----- magnesia,	100		
Oxy-muriate of potass,	6	40	
Phosphate of potass, very soluble.			
----- soda,	25	50	
----- ammonia,	25	25+	
----- magnesia,	6.6		
Sub-borate of soda,	8.4	16.8	
Carbonate of potass,	25	83.3	
----- soda,	50	100+	
----- magnesia,	2		
----- ammonia,	50+	100	
Acetate of potass,	100		
----- soda,	35		
----- ammonia, very soluble.			
----- magnesia do.			
----- strontia,		40.8	
Super-tartrate of potass,	1.67	3.3	
Tartrate of potass,	25		
----- potass and soda,	25		
Super-oxalate of potass,		40	
Citrate of potass, very soluble.			
Prussiate of potass and iron.			
Nitrate of silver very soluble.			
Muriate of mercury (corrosive sublimate),	5	50	
Sulphate of copper,	25	50	
Acetate of copper very soluble.			
Sulphate of iron,	50	130	
Muriate of iron very soluble.			

	Temperatures,	60°	212°
Tartrate of iron and potass.			
Acetate of mercury.			
Sulphate of zinc,	44		44+
Acetate of zinc very soluble.			
Acetate of lead, (Ed. Pharm.) Bostock.	27		
———— as it exists in Goulard's extract, more so.			
Tartrate of antimony and potass,	1.25		2.5
———— by my experiments,	6.6		33
Alkaline soaps very soluble.			
Sugar,	100		any quantity.
Gum very soluble.			
Starch,	0		very soluble.
Jelly,	sparingly,		abundantly.
Gelatin,	soluble,		more so.
Urea very soluble.			
Cinchonin.			

Salts not soluble in 100 times their weight of water.

Sulphates of baryta, strontia, and lime, and sub-sulphate of mercury.

Phosphates of baryta, strontia, lime, magnesia, and mercury.

Fluate of lime.

Carbonates of baryta, strontia, and lime.

Muriates of lead, and silver, and sub-muriate of mercury, (Calomel.)

Sub-acetate of copper.

SOLUBILITY of Saline and other Substances in 100 parts of Alcohol, at the temperature of 176°

All the acids, except the sulphuric, nitric, and oxy-muriatic, which decompose it, and the phosphoric and metallic acids.

Potass, soda, and ammonia, very soluble.

Red sulphate of iron,

Muriate of iron, 100

———— lime, 100

Nitrate of ammonia, 89.2

Muriate of mercury, 88.3

Camphor, 75.

Nitrate of silver, 41.7

Refined sugar, 24.6

Muriate of ammonia, 7.1

Arseniate of potass, 3.75

Nitrate of potafs,	2.9
Arfenate of foda,	1.7
Muriate of foda, (Mr. Chenevix).	Alkaline foaps. Magnesian
do. Extractive. Tannin. Volatile oils.	Adipocere. Re-
fins. Urea. Cinchonin.	

Substances insoluble in Alcohol.

Earths.

Phosphoric and Metallic acids.

Almost all the fulphates and carbonates.

The nitrates of lead and mercury.

The muriates of lead, silver, and foda.

The sub-borate of foda,

The tartrate of foda and potafs, and the super-tartrate of potafs.

Fixed oils, wax, and starch.

Gum, caoutchouc, suber, lignin, gelatin, albumen, and fibrin.

TABLE of the Absorption of GASES by 100 parts of Water at 60° F.

	Weight,	Volume.
Nitric acid,	1083.	361000.
Muriatic acid,	100.	56655.
Ammonia,	34.	47687.
Sulphurous acid, Fourcroy,	33.3	12109.
————— Dr. Thomson,	9.75	3546.
————— Dr. Priestley,	3.96	1440.
Carbonic acid,	0.1872	104.
Sulphuretted hydrogen,	0.1165	85.7
Nitrous oxide,	0.104	52.5
Oxy-muriatic acid,	0.043	
Nitric oxide,	0.0068	5.
Oxygen,	0.005143	3.7
Phosphuretted hydrogen,	0.00291	2.14
Carbonic oxide,	0.00238	2.01
Hydrogen,	0.0001505	1.61
Nitrogen,	0.001836	1.53
Carburetted hydrogen,		1.40



Fig. 1.

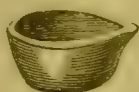


Fig. 3.



Fig 2.



Fig. 6.

Fig. 4.

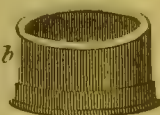
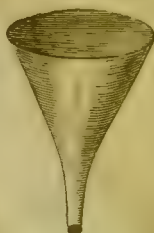


Fig.

5.

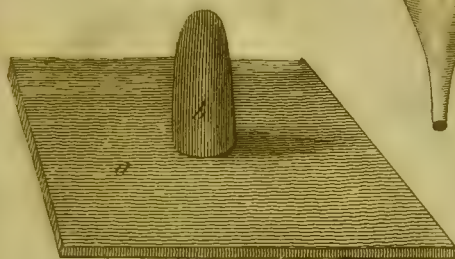


Fig. 9 .

Fig.

7.

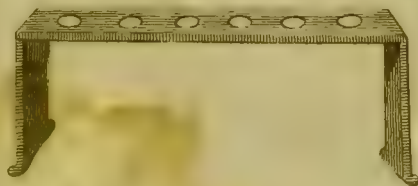


Fig. 10.

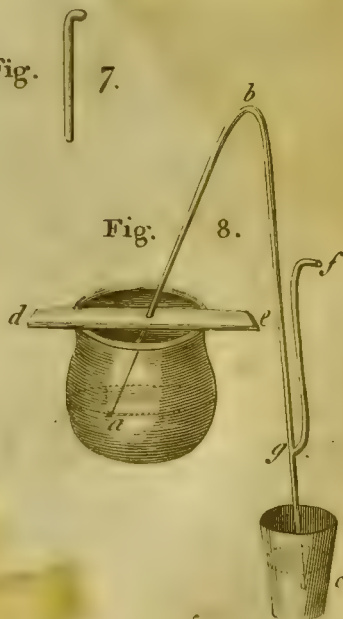
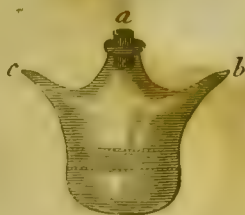


Fig.

8.





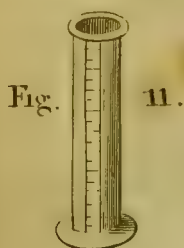


Fig. 14.

Fig. 15.

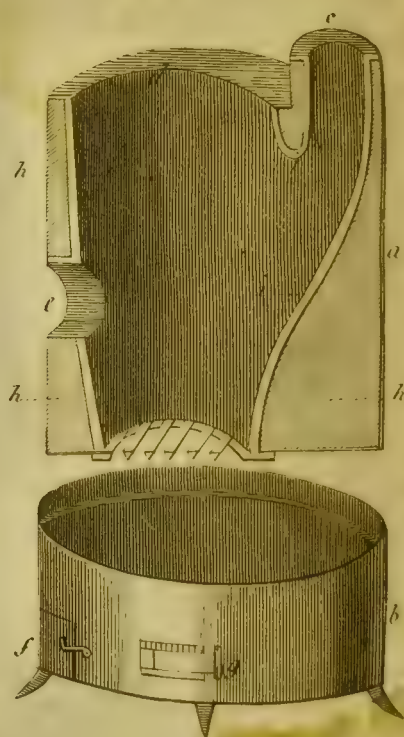
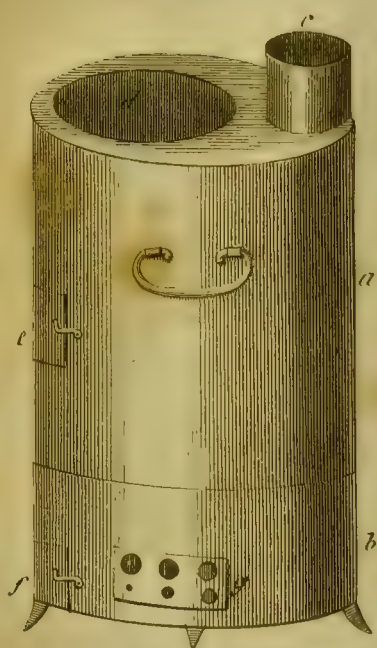


Fig. 16.

Fig. 17.

Fig. 18.



Fig. 19.

Fig. 20.



Fig. 21.



TABLE of *Efflorescent Salts*, (Cadet de Vaux).

288 grains of	in days	lost grains
Sulphate of soda - - - - -	61 - - - - -	203.
Phosphate of soda - - - - -	39 - - - - -	91.
Carbonate of soda - - - - -	51 - - - - -	86.

TABLE of *Deliquescent Salts*. (Cadet de Vaux).

288 grains of	in days	absorbed
Acetite of potass - - - - -	146 - - - - -	700
Muriate of lime - - - - -	124 - - - - -	684
----- manganese - - - - -	105 - - - - -	629
Nitrate of manganese - - - - -	89 - - - - -	527
----- zinc - - - - -	124 - - - - -	495
----- lime - - - - -	147 - - - - -	448
Muriate of magnesia - - - - -	139 - - - - -	441
Nitrate of copper - - - - -	128 - - - - -	397
Muriate of antimony - - - - -	124 - - - - -	388
----- alumina - - - - -	149 - - - - -	342
Nitrate of alumina - - - - -	147 - - - - -	300
Muriate of zinc - - - - -	76 - - - - -	294
Nitrate of soda - - - - -	137 - - - - -	257
----- magnesia - - - - -	73 - - - - -	207
Acetite of alumina - - - - -	104 - - - - -	202
Super-sulphate of alumina - - - - -	121 - - - - -	202
Muriate of bismuth - - - - -	114 - - - - -	174
Super-phosphate of lime - - - - -	93 - - - - -	165
Muriate of copper - - - - -	119 - - - - -	148





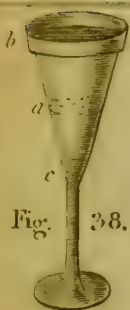


Fig. 38.

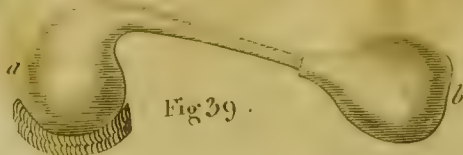


Fig. 39.

Fig. 40.



Fig. 43.

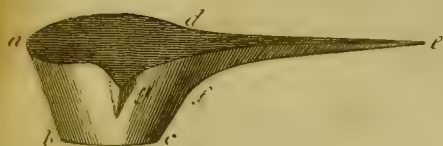


Fig. 41.

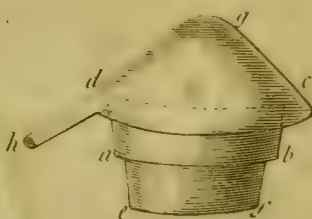


Fig. 42.

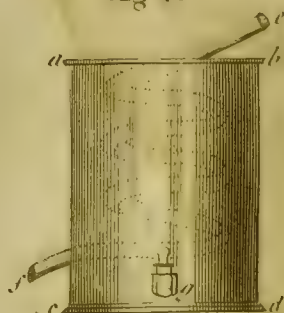


Fig. 46.



Fig. 44.

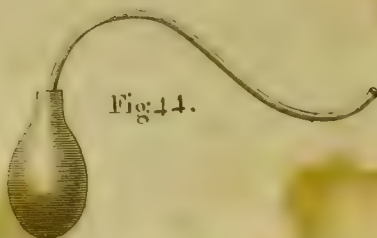


Fig. 49.



Fig. 50.



- c. The chimney.
- d. The circular hole for receiving the sand-pot:
- e. A door about the centre of the body, to be opened when the furnace is used as a reverberatory. In Dr. Black's furnace, there is properly no aperture in the side, and indeed as its peculiar excellence consists in the power which it gives the operator of regulating the quantity of air admitted to the fuel, and by that means of regulating the intensity of the fire; every aperture is rather to be considered as an injury than as an improvement; and at all times when they are not employed, they must be accurately closed and luted up.
- f. The door of the ash-pit.
- g. The damping plate for regulating the admission of air, having six holes, fitted with stoppers, increasing in size in a geometrical ratio.

Fig. 15. A vertical section of the body of the same furnace, to shew the manner of luting, and the form and position of the grate.

- a.—g. As in the former figure, except the damping plate, which is here closed by a sliding door with a graduated scale.
- b. The form which is given to the lute of clay and charcoal which is applied next to the iron.
- i. The form given to the lute of sand and clay, with which the former is lined.
- e. Is a semicircular aperture left unluted, to serve as a door when necessary. On other occasions it is filled up with a semi-cylindrical piece of fire-brick, Fig. 16. accurately luted in.
- k. The grate fastened on the outside of the body.

Fig. 16. A semi-cylindrical piece of fire-brick, for closing the door e. of the furnace.

Fig. 17. The sand-pot, which is suspended in the aperture d. of the furnace, by means of the projecting ring a. b.

Fig. 18. A muffle, a. a. apertures in its sides for the admission of the heated air.

Fig. 19. A large black-lead crucible.

Fig. 20. A small Hessian crucible.

Fig. 21. 22. Tests.

Fig. 23. A small support of clay, to raise the crucible above the grate.

Fig. 24. A pair of crucible tongs.

Fig. 25. A support for raising the muffle as high as the door c. of the furnace.

Fig. 26. A ring for suspending a retort within the furnace,



still enter it, and are condensed in their passage towards *f.* the lower termination of the pipe from which the distilled fluid runs, and is received into proper vessels. As the water in the vessel *a. b. c. d.* continually abstracts caloric from the vapours, it is apt to become too warm to condense them. As soon, therefore, as any steam escapes by the spout *f.* the water must be drawn off by the cock *g.* and its place supplied by cold water.

Fig. 43. A vessel for boiling inflammable fluids.

a. b. c. d. The body of the kettle.

d. e. f. A long spout proceeding from it, for preventing any risk of boiling over.

g. A short spout for pouring out. The vessel should not be filled above *b. f.* and the long spout *d. e. f.* should be placed so as to be as little heated as possible. When the fluid begins to swell and boil up, both from the great increase of surface, and from part of it running up the cooler spout *d. e. f.* the ebullition will be checked, and all danger of running over be prevented.

Fig. 44. A body with a bent tube.

a. b. The body.

b. c. A sigmoid tube accurately ground to it. When any permanently elastic fluid is generated within the body *a. b.* it escapes by the extremity of the tube, and may be collected by introducing it under a jar filled with water or mercury in the pneumatic cistern. This simple apparatus can only be used conveniently when the production of the gas is not rapid, or requires the application of heat.

Fig. 45. A Woulfe's apparatus.

a. b. c. c. d. e. A tubulated retort and receiver.

f. f.' f." Three three-necked bottles. The first, *f.* is commonly filled with water, and the two others with alkaline solutions.

d. g. d.' g.' d." g." d.'" g.'" Bent tubes connecting the different parts of the apparatus, so that when any vapour escapes from the receiver *c. d. e.* it passes along the tube *d. g.* and rises through the fluid contained in the bottle *f.* where it remains in contact with the surface, and under considerable pressure, until the expansion of the vapour, not condensable in *f.* overcomes the column of fluid *b. g.'* in the bottle *f.'* and escapes into the upper part of *f.'* In the same manner the uncondensed vapours proceed to *f."* and at last to the pneumatic apparatus.

But, as in processes of this kind, diminution of temperature and other causes, frequently produce sudden condensations of the gases, contained in the different parts of the apparatus, especially in the

retort and receiver, any such occurrence would cause the fluids to move through the connecting tubes in a retrograde direction. This accident is prevented, by inserting through the third neck of each bottle a small tube *k. l.* having its lower extremity *l.* immersed in the fluid contained in the bottle. By this contrivance no fluid can possibly pass from one bottle into another, because the columns *g. m.* &c. which resist the absorption, are much higher than the columns *b. l.* which oppose the admission of external air. While, on the contrary, no gas can escape through these tubes, because the columns *b. k.* which oppose their escape, are higher than the columns *g. b.* which resist its progress to the next bottle. From their use, these tubes have got the name of Tubes of Safety.

Another contrivance for the same purpose, the invention of C. Welter, seems now to be much used in France. It is fixed to the connecting tubes as at *n.*

Fig. 46. To explain it more fully, we have given a separate view, taken in an oblique direction. When the apparatus is adjusted, a small quantity of water is poured through the funnel *p.* until it rises to about the centre of the ball *o.* Now, on any absorption taking place, the fluid rises in the ball *o.* until the column *g. n.* be annihilated, when a quantity of air will immediately rush in through *p. g. n. o.* &c. and the water will regain its former equilibrium. On the other hand, no gas can escape by this tube, because the whole fluid contained in the ball and tube must previously enter the portion of the tube *n. p.* where it would form a column of such a height that its pressure could not be overcome.

Fig. 47. A vertical section of a pneumatic cistern.

a. b. c. d. The whole cavity of the cistern.

e. f. A shelf for holding the jars.

e. b. c. The well for filling the jars.

g. b. The surface of the fluid contained in the cistern, which must always be higher than the surface of the shelf.

Fig. 48. 49. 50. 51. Pneumatic jars of different shapes.

Fig. 48. A jar in the situation in which it is filled with gas.

Fig. 49. A jar fitted with a stop-cock.

Fig. 50. A jar placed upon a tray for removing it from the pneumatic cistern.

Fig. 51. A graduated jar, commonly called an Eudiometer.

Fig. 52. A hydrostatic funnel, for pouring fluids gradually into air-tight vessels, especially when attended with the formation of gas. It is evident, that any portion of fluid, poured into the funnel *x.* more than sufficient to fill the two first parts of the bent tube up to the level *z.* will escape by the lower extremity *b.* At the same time, no gas can return through this funnel, unless it

pressure be able to overcome the resistance of a column of fluid of the height of $x. y.$

Fig. 53. Another contrivance for the same purpose. It consists of a common funnel, in the throat of which is inserted a rod with a conical point, which regulates the passage of the fluid through the funnel, according to the firmness with which it is screwed in.

54. Nooth's apparatus for promoting the absorption of gaseous fluids by liquids. It consists of three principal pieces; a lower piece, *a. b.* a middle piece, *a. c.* and an upper piece, *d. c. e.*; all of which are accurately ground to each other. The substances from which the gas is to be extricated are put into the lower piece. The middle piece is filled with the fluid with which the gas is to be combined; and the upper piece is left empty. As soon as a sufficient quantity of gas is formed to overcome the pressure, it passes through the valve *f. g.* and rises through the fluid to the upper part of the middle piece. At the same time it forces a quantity of fluid into the upper piece through its lower aperture *d.* As soon as so much of the fluid has been forced from the middle piece as to bring its surface down to the level of the lower aperture of the upper piece, a portion of gas escapes into the upper piece, and the fluid rises a little in the middle piece. The upper piece is closed with a conical stopper *e.* which yields, and permits the escape of a portion of gas, as soon as its pressure in the upper piece becomes considerable. *b.* Is a glass cock for drawing off the fluid.

Fig. 55. The valve of Nooth's apparatus. It consists of an internal tube *g.* of small caliber, but pretty stout in substance, and ground into an external tube *f.* closed at the upper end, but perforated with small holes, to allow the gas to pass. After the internal tube is fitted to the external, a portion of it is cut out as at *b.* sufficient to receive a small hemisphere of glass, and to allow the hemisphere to rise a little in its chamber, but not to turn over in it. The upper piece of the internal tube is then thrust home into the place where it is to remain, and the glass hemisphere introduced with its plane recumbent on the upper end of the lower piece of the tube, which is ground perfectly flat, as is also the plane of the hemisphere. From this construction it is evident, that by the upward pressure of any gas, the glass hemisphere may be raised so as to allow it to pass, while nothing can pass downwards; for the stronger the pressure from above, the closer does the valve become. We have been more particular in our description of this valve, because it has been very ingeniously applied to distilling apparatuses by Mr. Pepys junior and Mr. Burkit.

CHEMICAL SIGNS.

It is unnecessary here to point out the advantages which might result from a well-contrived system of chemical signs. About the same time that the French chemists introduced their methodical nomenclature, they also proposed a corresponding system of chemical signs, which they intended should speak a language to be understood by the learned of all nations. In our explanation of their system, we shall nearly follow what Mr. Chenevix has said in his judicious remarks upon chemical nomenclature.

There are six simple radical signs, which may be considered as so many genera.

The first genus is the zig-zag line, and is used to denote light. See Plate VI, No. 1.

The second genus is the straight line. It comprehends three species, characterized by its direction.

Sp. 1. A perpendicular line denotes caloric, 3.

Sp. 2. A horizontal line denotes oxygen, 2.

Sp. 3. An oblique line from right to left, nitrogen, 4.

The third genus is a crescent, which is the generic sign of simple combustibles.

Sp. 1. With the horns inclined to the right, carbon, 5.

Sp. 2. The reverse of the former, hydrogen, 6.

Sp. 3. With the points upwards, sulphur, 7.

Sp. 4. The reverse of the latter, phosphorus, 8.

The fourth genus is a triangle. It comprehends the simple salifiable bases.

Sp. 1. With the point upwards, and the base horizontal, 9, the alkalies.

Sp. 2. With the point downwards, 10, the earths.

Each of the species of this genus comprehends several individuals, which are distinguished by inserting within the triangle the first letter of its name in the Latin language; or if two species begin with the same letter, the first letter of the second syllable is added: thus; for potash, P; soda, S; baryta, B; strontia, St; lime, C; magnesia, M; glucina, Gc; gadolina, Gd; or Y, for yttria; alumina, Al; zirconia, Z; silica, Sl.

The fifth genus is a circle, 11. It comprehends the metals; and the species are distinguished in the same manner as the former, by inserting within it the primary letters of the first and second syllables: thus; for gold, Ar; platinum, Pt; silver, Ag; mercury, H; copper, Cp; iron, Fr; lead, Pb; tin, Sn; zinc, Z; antimony, Sb, or At; bismuth, B; cobalt, Cb; nickel, Nk; manganese, Mg; uranium, U; titanium, Tt; tellurium, Tl; chromium, Cm; arsenic, As; molybdenum, Ml; tungsten, Ts; columbium, Cl.

Generic Signs										Combinations with Caloric	N ^o	Solid	Fluid	Gas
1	2	3	4	5	6	7	8	9	10		11	12	13	14
15	16	17	18	19	20	21	22	23	24		25	26	27	28
29	30	31	32	33	34	35	36	37	38		39	40	41	42
49	50	51	52	53	54	55	56	57	58		59	60	61	62
69	70	71	72	73	74	75	76	77	78		79	80	81	82
89	90	91	92	93	94	95	96	97	98		99	100	101	102
109	110	111	112	113	114	115	116	117	118		119	120	121	122
129	130	131	132	133	134	135	136	137	138		139	140	141	142
149	150	151	152	153	154	155	156	157	158		159	160	161	162
Generic Signs										Secondary Compounds				
N ^o	Bases	Oxides			Acids					N ^o				
		1 st	2 ^d	3 ^d	1 st	2 ^d	3 ^d							
14	/	7	7	/	/					43	P	53	M	59
15	C	7	C	C						44	P			CP Ac
16	)			)						45	P	54	H M	60
17	)			)						46	P	55	Fr	61
18	H	H	H	H						47	P			S
19	Fr	Fr		Fr						48	P	56	Fr	62
20	As			As						49	M	57	S	63
21	M									50	P			Pb ol
										51	S	58	Ac	64
										52	P		CP	Am



The sixth genus is a square. It comprehends all the unknown bases of the acids, and the bases of the compound oxides and acids.

Sp. 1. A square with perpendicular sides, 12. It contains the unknown and compound acidifiable bases.

Sp. 2. A square with inclined sides, 13. It contains the compound oxides. The individuals of both species are distinguished before.

All compound bodies are expressed by combinations of these simple characters. But as simple bodies are capable of uniting in various proportions, it becomes necessary that these proportions should be expressed; and relative position has appeared the most natural method of doing so. In general, when the proportion of any body in a compound is small, its sign is placed above, when large below, as in 35. 36. 42. &c.

Caloric exists in all bodies: but according to its relative quantity, they exist as solids, fluids, or gases. To express the first state, has not been thought necessary to introduce the sign of caloric; to express the second, it is placed above; and to express the third, below, as in the examples in the plate (22—32).

Oxygen also combines with many bodies, and in several proportions. The products resulting from these combinations are either oxides or acids. The oxides may be characterized by affixing the sign of oxygen to the left side of the sign of the base, and the acids by affixing it to the right; and the greater or less degree of each may be marked by placing it above or below, as in the examples in the plate. In this I have deviated from all the tables of chemical signs which I have seen, and, I trust, with propriety; for M. Chenevix has remarked of the system, that one of its chief defects is, the impossibility of marking, by any principles it points out, the difference of the metallic oxides.

A circle, with the mark of oxygen at the top, is the only method of marking a metallic oxide; for if we put the mark of oxygen lower, it will then have the force of an acid, and we must not confound the situation of the signs to mark differences of states, or the whole system will become confused."

But the alteration proposed enables us to mark no less than six states of oxygenization. When the sign of oxygen is placed on the left, it implies that the compound is an oxide; if it be placed at the top, it expresses the smallest degree of oxidization; at the bottom, the highest, and we have room for an intermediate one. The degrees of acidification are expressed in the same manner, except that the character of oxygen is placed to the right of the base. See 14—21. I have since found that the same proposal has been made by Dr. Vandier, in the *Journ. de Physique*, vol.

56; and this coincidence is a proof that it is not arbitrary, but arises naturally from an attentive consideration of the subject.

The other primary combinations are expressed in the same way. When they unite only in one proportion, or when the proportions are indifferent, the signs are placed indifferently, though it would be better to place them in one determinate way; but when either of them is in excess, its sign is always placed below. Thus heavy hydro-carbonous oxide is expressed by placing the sign of hydrogen above that of carbon, 36; light hydro-carbonous oxide, by reversing their position, 35. Glass is expressed by placing the signs of soda and silica side by side, 41; the liquor silicum, by placing the sign of the alkali under that of the earth, and adding the sign of fluidity above, 42.

The secondary compounds are expressed in a similar manner. The basis has been generally placed before the acid, to admit of the sign of the degree of acidification being added to the acid; and the same position fortunately admits of the sign of the degree of oxidizement being added to the oxide, when a metallic oxide forms the basis of the salt. The excess of acid or base is marked as before, by placing the acid or base below. With regard to the metallic salts, Mr. Chenevix has given some reasons for not introducing the sign of oxygen; but he himself has given the most powerful reason for introducing it, by proving that the real difference between calomel and corrosive sublimate is in the state of oxidizement of the metal. The manner of marking the oxides proposed above, enables us to express this difference distinctly, when the degree of oxidizement is ascertained.

EXPLANATION OF THE TABLE OF CHEMICAL SIGNS.

Generic Signs.

No.				
1. Light.	5. Carbon.	9. Alkalies.	11. Metals.	12. Acidifiable bases, un- known or compound.
2. Oxygen.	6. Hydrogen.	10. Earths.		
3. Caloric.	7. Sulphur.			
4. Nitrogen.	8. Phosphorus.			13. Compound oxides.

Combinations of Oxygen.

Oxides.				Acids.		
	1.	2.	3.	1.	2.	3.
Nitrogen.	Atmospheric air.	Nitrous oxide.	Nitric oxide.	Nitrous.		Nitric.
Carbon.	Incombust- ible coal.	Charcoal	Carbonic oxide.			Carbonic.
Hydrogen.			Water.			
Sulphur.			Oxide of sulphur.	Sulphur- ous.		Sulphuric.
Mercury.	Black oxide.	Yellow.	Red.			
Iron.	Green oxide.		Red.			
Arsenic.			White.			Arsenic.
Muriatic radical.				Muriati.	Oxygen- ized mu- riatic.	Hyper-ox- ygenized muriatic.

Combinations of Caloric.

22. Oxygen. 23. Nitrogen. 24. Sulphur. 25. Potafs.
 26. Acetic acid. 27. Ice. 28. Ammonia. 29. Sulphuric acid.
 30. Mercury. 31. White oxide of arsenic. 32. Acetate of Ammonia. The three columns represent the mode of characterizing the three states of aggregation of each of these substances.

Primary Compounds.

33. Ammonia. 34. Carburet of iron. 35. Light hydro-carbonous oxide. 36. Heavy hydro-carbonous oxide. 37. Sulphuretted phosphorus. 38. Phosphuretted sulphur. 39. Amalgam of gold. 40. Alloy of silver and copper. 41. Glafs. 42. Silicized Potafs.

Secondary Compounds.

43. Sulphite of potafs. 44. Sulphate of potafs. 45. Super-sulphate of potafs. 46. Sulphate of alumina. 47. Super-sulphate of alumina and potafs, alum. 48. Nitrate of potafs. 49. Muriate of ammonia. 50. Hyper-oxygenized muriate of potafs. 51. Tartrate of soda and potafs. 52. Sub-borate of soda. 53. Sub-muriate of mercury less oxidized, calomel. 54. Muriate of mercury more oxidized, corrosive sublimate. 55. Green sulphate of iron. 56. Brown sulphate of iron. 57. Tartrate of antimony and potafs. 58. Sub-acetate of copper. 59. Acetate of copper. 60. Soap of soda. 61. Soap of ammonia. 62. Hydroguretted sulphuret of potafs. 63. Litharge plaster. 64. Ammoniuret of gold. Fulminating gold.

PART II.

MATERIA MEDICA.

EVERY substance employed in the cure of disease, whether in its natural state, or after having undergone various preparations, belongs to the *Materia Medica*, in the extended acceptation of the words. But in most pharmacopœias, the *materia medica* is confined to simples, and to those preparations which are not supposed to be prepared by the apothecary himself, but to be purchased by him, as articles of commerce, from druggists and others.

Systematic authors on this branch of medical knowledge have bestowed much pains in contriving scientific arrangements of these articles. Some have classed them according to their natural resemblances; others according to their active constituent principles; and others according to their real or supposed virtues. Each of these arrangements has its particular advantages. The first will probably be preferred by the natural historian, the second by the chemist, and the last by the physiologist. But every scientific classification hitherto proposed is liable to numerous objections. Accordingly, in the pharmacopœias published by the colleges of physicians of London, Dublin, and Edinburgh, the articles of the *materia medica* are arranged in alphabetical order; and the same plan is now almost universally adopted. I shall therefore also follow it, subjoining to the name of each article, admitted by any of the British colleges, a short view of its natural, medical, and pharmaceutical history; and in thus forming a dictionary of *materia medica*, I shall generally adopt the nomenclature of the Edinburgh college.

In an appendix, I shall give a very concise account of such other substances as, from their possessing a place in some respectable foreign pharmacopœias, or from their active properties, seem of sufficient importance to be noticed. But to conjoin with the history of the *materia medica* given in alphabetical order the advantages of other methods, I shall add some of those arrangements which seem most useful.

ACIDUM ACETOSUM. (Ed.) *Acetum Vini.* (Dub.)
Acetum. (Lond.)

Vinegar. Impure acetous acid.

VINEGAR, as obtained by the fermentation of vinous liquors, besides the pure acetic acid diluted with much water, contains tartaric acid, tartrate of potash, mucilaginous matters, and sometimes phosphoric acid. The least impure is that prepared from white wine. It should be of a pale yellow colour, perfectly transparent, of a pleasant, somewhat pungent, acid taste, but without any acrimony. From the mucilaginous impurities which all vinegars contain, they are apt, on exposure to the air, to become turbid and ropy, and at last vapid. This inconvenience is best obviated by keeping them in bottles completely filled and well corked. They are said to keep better if they are boiled a few minutes before they be corked.

Vinegar is sometimes adulterated with sulphuric acid. Its presence is detected, if, on the addition of a solution of nitrate of baryta to the suspected vinegar, a white precipitate is formed, which is insoluble in nitric acid, after having been burnt in the fire. With the same intention of making the vinegar appear stronger, different acrid vegetables are occasionally infused in it. This fraud is difficult of detection; but when tasted with attention, the pungency of such vinegar will be found to depend rather on acrimony than acidity.

Vinegar possesses strong antiseptic powers on dead animal and vegetable matters. Hence its employment in pickling. The fine green colour, so much admired in some vegetable pickles, is often improperly given them by means of copper. This poisonous addition is easily detected, on dropping some carbonate of ammonia into the suspected vinegar, by the fine blue colour produced.

Medical uses.—Its action on the living body is gently stimulant and astringent. It promotes transpiration and the discharge by urine; and used moderately as a condiment, it facilitates digestion.

Vinegar is employed as a useful addition to drink in inflammatory fevers, in the proportion of about an ounce to a quart. As a medicine, it is used in putrid diseases, in scurvy, and to counteract the effects of narcotic poisons and mephitic vapours. In the form of glyster, it is used in the same diseases, and in obstinate constipation. Externally, it is applied in fomentations and baths, as a stimulant and discutient; and its vapour is inhaled in putrid sore throat, and diffused through the chambers of the sick, to correct the putrescency of the atmosphere.

Official preparations.—*Acidum acetosum destillatum.* *Edin. Lond. Dub.* *Acid. acet. aromaticum.* *Ed.* *Acid. acetof. forte.* *Ed.* *Acid. acet. camphoratum.* *Ed.* *Syrupus acidi acetosi.* *Ed.* *Mel acetat.* *Lond. Dub.* *Syr. colchici.* *Ed.* *Oxymel colchici.* *Lond.* *Oxymel scillæ.* *Lond.* *Oxymel æruginis.* *Lond.* *Acetum scillæ.* *Lond. Dub.* *Cataplas. sinap.* *Lond. Dub.* *Cerat. saponis.* *Lond. Dub.*

ACIDUM SULPHURICUM. *Ed.* *Acidum vitriolicum.* (*Lond. Dub.*) *Oleum vitrioli.*

Sulphuric acid, *Vitriolic acid, oil of vitriol.*

THE London and Edinburgh colleges direct, that in the shops its specific gravity should be to that of water as 1850 to 1000; the Dublin college as 1845 to 1000. This want of uniformity is to be regretted.

The physical and chemical properties of this acid have been already enumerated. As it is prepared by the trading chemist, it is inserted among the materia medica. It is obtained in two ways; by distilling off the acid from sulphate of iron, previously deprived of its water of crystallization by heat, or by burning sulphur in large leaden chambers, with an eighth part of nitrate of potash to supply the necessary oxygen. In the first way the strongest acid is obtained, but it is apt to contain iron or copper. By the second process it generally contains lead, which is easily detected by mixing a portion of the acid with three parts of distilled water, and if the acid be impure, a deposition will be formed. It may be rendered perfectly pure by distillation, filling a retort half full of the common acid, and distilling in a sand-bath, gradually heated as long as any acid comes over. The receiver should not be luted on.

Sulphuric acid powerfully decomposes dead animal matter. It becomes diluted with water formed by the union of the hydrogen and oxygen; another portion of the hydrogen combines with the azote to form ammonia, and the carbon is separated in the state of charcoal. The affinities which regulate this action are so powerful, that it produces the same effects on the living solid, and therefore it acts upon them as a corrosive. But to its employment with this view, its fluidity is an objection, as it cannot be easily managed.

Medical uses.—When sufficiently diluted, it is an excellent tonic, checking fermentation, exciting appetite, promoting digestion, and quenching thirst, and it is therefore used with success in morbid acidity, weakness, and relaxation of the stomach. As an astringent, it is used in hæmorrhagies; and from its refrigerant and antiseptic properties, it is a valuable medicine in many fe-

brile diseases, especially those called putrid. If taken in any considerable quantity, or for some time, it seems to pass off undecomposed by the kidneys or skin; and it is perhaps by its stimulant action on the latter, that it is advantageously employed internally, in psora, and other cutaneous affections. The best mode of prescribing it, is to order the quantity of acid to be used, and to direct it to be mixed with as much water as will render it palatable, to which some syrup or mucilage may be added. To prevent it from attacking the teeth, it may be conveniently sucked through a quill, and the mouth should be carefully washed after each dose.

Externally it is used as a gargle, particularly in putrid sore throats, and in aphthous mouths, and as a wash in cutaneous eruptions, and ill-conditioned ulcers. Made into an ointment with sixteen times its weight of axunge, it has been used to cure psora.

Off. prep.—Acid. sulph. dilutum, *Ed. Lond. Dub.* Acid. sulph. aromaticum, *Ed.* It is also used in the preparation of acid. nitr. *Ed. Lond. Dub.* Acid. muriat. *Ed. Lond. Dub.* Aqua supercarb. potassæ, *Ed.* Sulphas potassæ, *Ed.* Phosphas sodæ, *Ed.* Murias antim. *Ed. Lond. Dub.* Sulphas ferri, *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.* Sub-sulphas hydrarg. flavus, *Ed. Lond. Dub.* Æth. sulph. *Ed. Lond. Dub.*

ACIPENSER. *Pisces Branchioslegi*, Cuvier, Isinglas.

Sp. A. Hufo. *Lond.*

The Beluga, or Isinglas fish.

Sp. A. Ruthenus. *Lond.*

The Sterlet, or Caviar-sturgeon.

Officinal—Ichthyocolla, Isinglas.

Besides those mentioned by the London college, isinglas is prepared from other species of Acipenser, especially *A. sturio*, the sturgeon, and *A. stellatus*, the ferruga.

The preparation of isinglas is almost peculiar to Russia. It is made in all places where the large species of sturgeon are caught, as on the Dnieper, the Don, and especially on the Caspian sea, also on the Volga, the Ural, the Oby, and the Irtysh. That prepared from the sturgeon is reckoned the best, and next to it, that from the beluga. It also varies, according to the mode of preparation. On the Volga and Ural, the sounds are watered while fresh, and dried to a certain degree. The outer skin is next taken off, and the inner glossy white membrane is twitted into proper shapes, and then completely dried. The best is usually rolled into the form of a snake or heart; the second folded in leaves, like a book; and the worst is dried without any care. In other

places, as at Gurief, fish-glue is extracted from the sounds by boiling. This is cut into slabs or plates, is perfectly transparent, and has the colour of amber. On the Okka, where the sterlet only is to be had, the sounds are beat just as they are extracted from the fish, and dried into glue.

Good isinglas is white, in some degree transparent, dry, composed of membranes, not too thick, and without any smell.

The properties of isinglass depend entirely on the gelatin, of which it principally consists. One hundred grains of good isinglas was found by Mr. Hatchett to contain rather more than ninety-eight of matter soluble in water. A nutritious jelly may be prepared from it. A watery solution of it is used as a test of the presence of tannin, and for the clarification of spiritous liquors. Mr. Davy's solution for the former purpose consists of 120 grains of isinglas dissolved in twenty ounces of water; and if properly made, it has a tendency to gelatinize, at temperatures below 50. F.

It is said to be employed for the preparation of English court-plaster.

ACONITUM NEOMONTANUM. *Aconitum*. (Lond. Dub.)

A. Napellus. (Ed.)

Large Blue Wolfsbane, Monk's-hood, Aconite.

Linnaei species plantarum, edit. Willdenow, genus 1062, species 9.

Polyandria Trigynia.—Nat. ord. *Multifiliquæ*.

Officinal—Herba, (Lond.) Folia, (Ed. Dub.) The leaves.

THIS, we are assured by Willdenow, is the species of aconite which has always been used in medicine; although it is almost universally known by the name of *Aconitum Napellus*, in consequence of a botanical error of Stoerk, who introduced it into practice.

It is a perennial plant, found in the Alpine forests of Carinthia, Carniola, and other mountainous countries in Germany, and cultivated in our gardens.

The fresh plant and root are very violent poisons, producing remarkable debility, paralysis of the limbs, convulsive motions of the face, bilious vomiting, and catharsis, vertigo, delirium, asphyxia, death. The fresh leaves have very little smell, but when chewed, have an acrid taste, and excite lancinating pains, and swelling of the tongue. By drying, its acrimony is almost entirely destroyed. For medical use, the plant must be gathered before the stem shoots.

Uses and dose.—When properly administered, it acts as a penetrating stimulus, and generally excites sweat, and sometimes an increased discharge of urine.

On many occasions, it has been found a very effectual remedy

in glandular swellings, venereal nodes, anchylofis, spina ventosa, itch, amaurofis, gouty and rheumatic pains, intermittent fevers, and convulsive disorders.

We may begin by giving one or two grains of the dried leaves in powder; but it is commonly used in the form of an inspissated juice. As soon as the plant is gathered, the juice is expressed, and evaporated without any previous clarification, to the consistence of an extract. It is an unfortunate circumstance, that the powers of this medicine vary very much, according to its age, and the heat employed in its preparation. When recently prepared, its action is often too violent; and when kept more than a year, it becomes totally inert. It may therefore be laid down as a universal rule, in the employment of this and of many other similar active medicines, to begin with very small doses, and to increase them gradually to the necessary degree; and whenever we have occasion to begin a new parcel of the medicine, we should again commence with the smallest dose, and proceed with the same caution as at first.

We may begin by giving half a grain of this extract, either formed into a powder with ten grains of white sugar, or made up with any convenient addition into a pill, twice or thrice a-day, and gradually increase the dose: or a tincture of aconite may be prepared, by digesting one part of the dried leaves in six parts of spirit of wine; the dose of which will be at first five or ten drops, and may be gradually increased to forty.

Off. prep.—Succus spissatus aconiti napelli, (*Ed.*)

ACORUS CALAMUS. (*Edin.*) *Calamus aromaticus.* (*Lond. Dub.*)

Sweet flag.

Willd. g. 663, *sp.* 1.—*Hexandria Monogynia.*—*Nat. ord. Piperitæ.*

Off.—Radix. The root.

This plant is perennial, and grows plentifully in rivulets and marshy places about Norwich, and other parts of England, in the canals of Holland, in Switzerland, and in other countries of Europe. The shops have been usually supplied from the Levant with dried roots, which do not appear to be superior to those of our own growth.

The root of acorus is full of joints, crooked, somewhat flattened on the sides, internally of a white colour, and loose spongy texture; its smell is strong; the taste warm, acrid, bitterish, and aromatic; both the smell and taste are improved by exsiccation. This root is generally looked upon as a carminative and stomachic medicine, and as such is sometimes made use of in practice. It is said by some, though erroneously, to be superior in aromatic fla-

vour to any other vegetable that is produced in these northern climes. It is, nevertheless, a sufficiently elegant aromatic. The fresh root candied is said to be employed at Constantinople as a preservative against epidemic diseases. The leaves of this plant have a sweet fragrant smell, more agreeable, though weaker, than that of the roots.

Neumann obtained by distillation about two scruples of fragrant volatile oil from sixteen ounces of the dried root. It also rose in distillation with water, but not with alcohol. The spiritous extract from two ounces weighed 370 grains, and water extracted from the residuum, 190 grains. The watery extract from two ounces weighed 455 grains, and the residuum gave out to alcohol 43.

ÆSCULUS HIPPOCASTANUM. (*Ed*) *Hippocastanum*.

Heiße chesnut.

Willd. g. 717, sp. 1. Heptandria Monogynia.—Nat. ord. *Tribilata*.

Officinal—Semen, cortex. The seed and bark.

This is a very common and well-known tree. The fruit, which probably contains much amylaceous matter, has been used as food for domestic animals, and even for men, in times of scarcity. But its introduction into the Edinburgh Pharmacopœia was probably owing to its having been used and recommended as a sternutatory in some cases of ophthalmia and headach. With this view it was drawn up the nostrils, in the form of an infusion or decoction.

The bark has been proposed as an indigenous substitute for the very expensive and often adulterated Peruvian bark. Many successful experiments of its effects, when given internally in intermittent and typhous fever, and also when applied externally in gangrene, sufficiently warrant future trials. Although chemical analysis is not yet sufficiently advanced, to enable us to determine from it the medical use of any substance, I may observe, that the active constituent of this bark is tannin, which is scarcely compatible with the presence of cinchonin, the predominant, and probably the active, constituent of Peruvian bark. In powder, it may be given to the extent of a scruple and a half, or a drachm, for a dose. Buchholz prefers a solution of a drachm of the extract in an ounce of cinnamon water, of which sixty drops are to be given every three hours.

ALCOHOL. (*Ed.*) *Spiritus vinosus rectificatus.* (*Lond.*) *Spiritus vini rectificatus.* (*Dub.*)

Alcohol, rectified spirit of wine.

The spirit distilled from wine, or other fermented liquors per-

fectly free from any unpleasant smell, and of which the specific gravity is to that of water as 835 to 1000, such as may be easily procured. (*Ed.*) The London college order a spirit of the same specific gravity, and add, that it contains 95 parts of pure alcohol, and five of water. The Dublin college order it of the specific gravity 840.

Alcohol forms the true characteristic of vinous liquors, and arises from the decomposition of sugar, being always in proportion to its quantity. It is found in greatest quantity in the wines of warm countries, and in wines prepared from thoroughly ripened fruit. In the south of France, some wines yield a third of brandy. It is the proportion of alcohol which renders wines more or less generous, and prevents them from becoming sour. The richer a wine is in alcohol, the less malic acid it contains; and therefore the best wines give the best brandy, because they are free from the disagreeable taste which the malic acid imparts to them. Old wines give better brandy than new wines, but less of it.

Alcohol is procured from wine by distillation; in conducting which, the following rules are to be observed:

1. To heat the whole mass of fluid at once, and equally.
2. To remove all obstacles to the ascent of the vapour.
3. To condense the vapour as quickly as possible.

The distillation is continued until the liquor which comes over is not inflammable.

Baumé mentions a very remarkable fact concerning the preparation of alcohol. He distilled two pounds of alcohol, specific gravity 832, in the water bath, and filled the refrigeratory with ice, and he obtained two pounds four ounces of an alcohol having only specific gravity 862. This he ascribes to water condensed from the air in the worm by the coldness of the ice; and he assures us, from experience, that to get an alcohol of 827, it is absolutely necessary that the refrigeratory be filled with water of 145° F.

Distillers judge of the strength of their spirits by the size and durability of the bubbles it forms, when poured from one vessel into another, or in agitating it in a vessel partly filled. Another proof is, by the combustion of gunpowder: some of which is put in a spoon; it is then covered with the spirit to be tried, which is set on fire; if it kindle the gunpowder, it is supposed to be strong, and *vice versa*. But a small quantity of spirits will always kindle gunpowder, and a large quantity never. Another proof is by the carbonate of potash, which attracts the water, and dissolves in it, while the alcohol swims above. But all these are

uncertain; and dependence can only be put in the proof by hydrometers, or some such contrivance, for ascertaining the weight of a given quantity at a given temperature.

In this country, alcohol is procured from an infusion of malt, and before its rectification is termed Whisky. In the East-Indies, arrack is distilled from rice; in the West-Indies, rum from the sugar-cane; and in France and Spain, brandy from wine. Of all these, the French brandy is the finest spirit; for the others are more or less impregnated with essential oils, of which it is almost impossible to free them entirely. When any ardent spirit is re-distilled to procure alcohol, the water-bath is commonly used, which gives a more equal and temperate heat, and improves the product. Gren says, that the addition of four pounds of well-burnt charcoal, and three or four ounces of sulphuric acid, previous to this rectification, destroys entirely the peculiar taste of malt spirit; and that a second rectification with one pound of charcoal, and two ounces of sulphuric acid, affords an alcohol of very great purity. But the affinity of alcohol for water is so very strong, that it cannot be obtained entirely free from it by simple distillation. We must, therefore, abstract the water by means of some substance which has a stronger affinity for it than alcohol has. Carbonate of potash was formerly employed; but muriate of lime is preferable, because its affinity for water is not only very great, but by being soluble in alcohol, it comes in contact with every particle of the fluid. For this purpose, one part of muriate of lime, rendered perfectly dry by having been exposed to a red heat, and powdered after it becomes cold, is put into the still. Over this, three parts of highly rectified spirits are to be poured, and the mixture well agitated. By distillation with a very gentle heat, about two-thirds of the spirit will be obtained in the state of perfectly pure alcohol.

The chemical properties of alcohol have been already mentioned.

Medical uses.—On the living body alcohol acts as a most violent stimulus. It coagulates all the albuminous and gelatinous fluids, and corrugates all the solids. Applied externally, it strengthens the vessels, and thus may restrain passive hæmorrhagies. It instantly contracts the extremities of the nerves it touches, and deprives them of sense and motion; by this means easing them of pain, but at the same time destroying their use. Hence employing spiritous liquors in fomentations, notwithstanding the specious titles of vivifying, heating, restoring mobility, resolving, dissipating, and the like, usually attributed to them, may sometimes be attended with unhappy consequences. These liquors received undiluted into the stomach, produce the same effects, contracting all the solid parts which they touch, and destroying, at least for a time,

their use and office; if the quantity be considerable, a palsy or apoplexy follows, which ends in death. Taken in small quantity, and duly diluted, they act as a cordial and tonic: if farther continued, the senses are disordered, voluntary motion destroyed, and at length the same inconveniencies brought on as before. Vinous spirits, therefore, in small doses, and properly diluted, may be applied to useful purposes in the cure of diseases; whilst in larger ones they produce the most deleterious effects.

Off. prep.—Alcohol, *Lond. Dub.* Alcohol ammoniat. *Ed.* Æther sulph. *Ed. Lond. Dub.* Æth. sulph. cum alcohole, *Ed. Lond. Dub.* Oleum vini, *Lond.* Spiritus æth. nitros. *Ed. Lond. Dub.* It also enters into the preparation of all tinctures and distilled spirits, and is used undiluted in Tinct. assæ foetid. *Ed. Lond. Dub.* T. Balsami Peruviani, *Lond.* T. Benzoes comp. *Lond. Ed.* T. Camph. *Ed. Lond. Dub.* T. Guaiaci, *Ed.* T. Mosche, *Dub.* T. Myrrhæ, *Dub.* T. Saponis, *Ed.* T. Toluiferæ balsam, *Ed. Lond. Dub.* Spt. Lavand. *Ed. Lond. Dub.* Spt. Rorismar. *Ed. Lond.*

ALCOHOL DILUTUM. (*Ed.*) *Spiritus vinosus tenuior.* (*Lond.*) *Spiritus vini tenuior.* (*Dub.*)

Diluted alcohol. Spirit of wine. Proof spirit.

ALCOHOL mixed with an equal quantity of water, being somewhat weaker than proof spirit; its specific gravity is to that of distilled water as 935 to 1000. (*Ed.*) The London and Dublin colleges order it of the specific gravity of 930, which, according to the former, contains 55 parts of pure alcohol, and 45 of water.

Although it be desirable that diluted alcohol should always be prepared, by mixing rectified spirit with water, instead of employing an impure spirit of the requisite strength, it is hardly to be expected that apothecaries will either be at the trouble or expence. The diluted alcohol of the Edinburgh college is somewhat weaker than that of the other two colleges; but besides that it is more convenient for their mode of preparing it, this will be attended with no disadvantage, as it is still sufficiently strong for any purpose to which it may be applied.

Official preparations.—Alcohol ammon. *Lond. Dub.* and all the tinctures and distilled spirits, except those made with alcohol. It is also used, somewhat extravagantly, in the preparation of various extracts.

TABLE of the Specific Gravities according to Gilpin, and degrees according to Baumé's hydrometer, of various mixtures of Alcohol and Water, and in Clarke's hydrometer, used by the revenue.

WATER. ALCOHOL.		SPECIFIC GRAVITIES.			BAUME.	SP GR.	CLARKE.
		60°	55°	55°		60°	
							Spirit
0	100	.825	.82736	38		833	of wine.
10	100	.84568	.84802	34+		858	1 to 2
20	100	.86208	.86441	30—		881	1 to 3
30	100	.87569	.87796	29+		891	1 to 4
40	100	.88720	.88945	27+		896	1 to 5
50	100	.89707	.89933	25+		900	1 to 6
60	100	.90549	.90768	23—		904	1 to 7
70	100	.91287	.91502	22		907	1 to 8
80	100	.91933	.92145	21—		909	1 to 9
90	100	.92499	.92707	20—		910	1 to 10
100	100	.93002	.93208	19—		913	1 to 15
100	90	.93493	.93696	19+		916	1 to 20
100	80	.94018	.94213	18		920	Proof.
100	70	.94579	.94767	17—		926	1 in 20
100	60	.95181	.95357	16—		928	1 in 15
100	50	.95804	.95966	16+		932	1 in 10
100	40	.96437	.96575	15+		933	1 in 9
100	30	.97074	.97181	14+		934	1 in 8
100	20	.97771	.97847	13+		936	1 in 7
100	10	.98654	.98702	12+		938	1 in 6
100	0	1.		10		942	1 in 5
						945	1 in 4
						954	1 in 3
						964	1 in 2

ALLIUM.

Willd. g. 626.—*Hexandria Monogynia*.—Nat. ord. *Liliaceæ*.

Sp. 14. ALLIUM SATIVUM. (Ed. Lond. Dub.)

Garlic.

Off.—Radix. The root.

THE garlic is a perennial bulbous-rooted plant, which grows wild in Sicily, and is cultivated in our gardens. The root consists of five or six small bulbs, called *cloves*, inclosed in one common membranous coat, but easily separable from each other. All the parts of this plant, but more especially the roots, have a strong offensive, very penetrating and diffusible, smell, and an acrimonious, almost caustic, taste. The root is full of a limpid juice, of which it furnishes almost a fourth part of its weight by expression. It also loses about half its weight by drying, but

scarcely any of its smell or taste. By decoction its virtues are entirely destroyed; and by distillation it furnishes a small quantity of a yellowish essential oil, heavier than water, which possesses the sensible qualities of the garlic in an eminent degree. Its peculiar virtues are also in some degree extracted by alcohol and acetic acid.

By Newmann's analysis, it lost two thirds of its weight by exsiccation. By decoction from 960 parts, water extracted 380, and the residuum yielded 27 to alcohol, and was reduced to 40. Alcohol applied first, extracted 123, the residuum yielded 162 to water, and was reduced to 40. In both cases the alcoholic extract was unctuous and tenacious, and precipitated metallic solutions. But the active ingredient was a thick ropy essential oil, according to Hagen heavier than water, not amounting to more than 1.3 of the whole, in which alone resided the smell, the taste, and all that distinguishes the garlic.

Medical use.—Applied externally, it acts successively as a stimulant, rubefacient, and blister. Internally, from its very powerful and diffusible stimulus, it is often useful in diseases of languid circulation and interrupted secretion. Hence, in cold leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, sudorific; it has also been by some supposed to be emmenagogue. For the same reason, in cases in which a phlogistic diathesis, or other irritability prevails, large doses of it may be very hurtful.

It is sometimes used by the lower classes as a condiment, and also enters as an ingredient into many of the epicure's most favourite sauces. Taken in moderation, it promotes digestion; but in excess, it is apt to produce headach, flatulence, thirst, febrile heat, and inflammatory diseases, and sometimes occasions a discharge of blood from the hæmorrhoidal vessels.

In fevers of the typhoid type, and even in the plague itself, its virtues have been much celebrated.

Garlic has been said to have sometimes succeeded in curing obstinate quartans, after cinchona had failed. In catarrhal disorders of the breast; asthma, both pituitous and spasmodic; flatulent colics; hysterical and other diseases, proceeding from laxity of the solids, it has generally good effects: it has likewise been found serviceable in some hydropic cases. Sydenham relates, that he has known the dropsy cured by the use of garlic alone; he recommends it chiefly as a warm strengthening medicine in the beginning of the disease.

It is much recommended by some as an anthelmintic, and has been frequently applied with success externally as a stimulant to indolent tumours, in cases of deafness proceeding from atony or rheumatism, and in retention of urine, arising from debility of the bladder.

Garlic may either be exhibited in substance, and in this way several cloves may be taken at a time without inconvenience, or the cloves cut into slices may be swallowed without chewing. This is the common mode of exhibiting it for the cure of intermittents.

The expressed juice, when given internally, must be rendered as palatable as possible, by the addition of sugar and lemon juice. In deafness, cotton moistened with the juice is introduced within the ear, and the application renewed five or six times in one day.

Infusions in spirit, wine, vinegar, and water, although containing the whole of its virtues, are so acrimonious, as to be unfit for general use; and yet an infusion of an ounce of bruised garlic in a pound of milk, was the mode in which Rosenstein exhibited it to children afflicted with worms.

But by far the most commodious form for administering garlic, is that of a pill or bolus conjoined with some powder, corresponding with the intention of giving the garlic. In dropsy, calomel forms a most useful addition. It may also sometimes be exhibited with advantage in the form of a clyster.

Garlic made into an ointment with oils, &c. and applied externally, is said to resolve and discuss indolent tumours, and has been by some greatly esteemed in cutaneous diseases. It has likewise sometimes been employed as a repellent. When applied under the form of a poultice to the pubis, it has sometimes proved effectual in producing a discharge of urine, when retention has arisen from a want of due action in the bladder. Sydenham assures us, that among all the substances which occasion a derivation or revulsion from the head, none operates more powerfully than garlic applied to the soles of the feet: he was led to make use of it in the confluent small-pox, about the eighth day, after the face began to swell, the root cut in pieces, and tied in a linen cloth, was applied to the soles, and renewed once a-day till all danger was over.

Sp. 43. ALLIUM CEPA. Cepa. (Dub.)

Onion.

Officinal—Radix. The root.

THIS is also a perennial bulbous-rooted plant. The root is a simple bulb, formed of concentric circles. It possesses in general the same properties as the garlic, but in a much weaker degree. Neumann extracted from 480 parts of the dry root, by means of alcohol, 360, and then by water 30; by water applied first 395, and then by alcohol, 30: the first residuum weighed 56, and the second 64. By distillation the whole flavour of the onions passed over, but no oil could be obtained.

Medical uses.—Onions are considered rather as an article of food than of medicine: they are supposed to yield little or no nourishment, and when eaten liberally produce flatulencies, occasion thirst, headaches, and turbulent dreams; in cold phlegmatic habits, where viscid mucus abounds, they doubtless have their use; as by their stimulating quality they tend to excite appetite, and promote the secretions: by some they are strongly recommended in suppressions of urine, and in dropsies. The chief medicinal use of onions in the present practice is in external applications, as a cataplasm for suppurating tumours, &c.

ALOE PERFOLIATA. (*Ed.*)

Willd. g. 659. sp. 3.—Hexandria Monogynia.—Nat. ord. Liliaceæ.

A perennial plant, of which there are many varieties which grow in the south of Europe, Asia, Africa, and America. But Thunberg says, that the finest aloes are prepared from the *Aloe spicata*, the second species of Willdenow, which grows at the Cape of Good Hope.

During four years that the Cape of Good Hope was in possession of the British, more than 300,000 pounds, the produce of that settlement, were imported into England; and as this quantity was infinitely greater than could be required for the purposes of medicine, it is not improbable, that, as Mr. Barrow states, its principal consumption was by the London porter brewers.

1. ALOE SOCOTORINA. *Lond. Ed. Dub.*

Socotorine aloes.

Officinal.—Gummi-resina. The gum-resin.

THIS article is brought, wrapt in skins, from the island of Socotora in the Indian ocean. This sort is the purest of the three in use: it is of a glossy surface, clear, and in some degree pellucid: in the lump, of a yellowish red colour, with a purple cast; when reduced to powder, of a bright golden colour. It is hard and friable in the winter, somewhat pliable in summer, and grows soft between the fingers. Its taste is bitter, accompanied with an aromatic flavour, but insufficient to prevent its being disagreeable; the smell is not very unpleasant, and somewhat resembles that of myrrh.

It is prepared by pulling off the leaves in July, from which the juice is expressed, and afterwards boiled and skimmed. It is then preserved in skins, and dried in August in the sun. According to others, the leaves are cut off close to the stem and hung up. The

juice which drops from them without any expression, is afterwards dried in the sun.

2. BARBADOES, or HEPATIC ALOES.

HEPATIC aloes is not so clear and bright as the foregoing sort; it is also of a darker colour, more compact texture, and for the most part drier. Its smell is much stronger and more disagreeable; the taste intensely bitter and nauseous, with little or nothing of the fine aromatic flavour of the socotorine. The best hepatic aloes comes from Barbadoes in large gourd shells, and an inferior sort of it, which is generally soft and clammy, is brought over in casks. In Barbadoes the plant is pulled up by the roots, and carefully cleaned from the earth and other impurities. It is then sliced into small hand-baskets and nets, which are put into large iron boilers or cauldrons with water, and boiled for ten minutes, when they are taken out, and fresh parcels supplied till the liquor is strong and black, which is then strained into a deep vat, narrow at bottom, where it is left to cool and to deposit its feculent parts. Next day the clear liquor is drawn off by a cock, and again committed to a large iron vessel. At first it is boiled briskly, but towards the end it is slowly evaporated, and requires constant stirring to prevent burning. When it becomes of the consistence of honey, it is poured into gourds or calabashes for sale, and hardens by age.

3. FETID, CABALLINE, or HORSE, ALOES.

THIS sort is easily distinguished from both the foregoing, by its strong rank smell; although, in other respects, it agrees pretty much with the hepatic, and is not unfrequently sold in its stead. Sometimes the caballine aloes is prepared so pure and bright, as not to be distinguishable by the eye even from the socotorine; but its offensive smell, of which it cannot be divested, readily betrays it. It is now excluded from the list of almost all modern pharmacopœias, and is employed solely by farriers.

From sixteen ounces of aloes Neumann extracted near fifteen by means of alcohol. From the residuum water took up one drachm, about an ounce of impurities being left; on inverting the procedure and applying water first, he obtained but thirteen ounces and a half of watery extract, and from the residuum alcohol dissolved an ounce and a half. According to this analysis, 1000 parts of aloes contains about 78 soluble in water only, or analagous to

gum, 980 soluble in alcohol only, or resinous, and 895 soluble both in alcohol and in water, or extractive. The constituent principles of aloes therefore appear to be resin and extractive. Dr. Lewis also remarks that decoctions of aloes let fall a precipitate, as they cool, probably from extractive being more soluble in boiling than in cold water. He also proved the hepatic aloes to contain more resin and less extractive than the socotorine, and this less than the caballine. The resins of all the sorts, purified by alcohol, have little smell; that obtained from the socotorine has scarce any perceptible taste; that of the hepatic, a slight bitterish relish; and the resin of the caballine, a little more of the aloetic flavour. The extractive obtained separately from any of the kinds, is less disagreeable than the crude aloes: the extractive of socotorine aloes has very little smell, and is in taste not unpleasant; that of the hepatic has a somewhat stronger smell, but is rather more agreeable in taste than the extract of the socotorine: the extractive of the caballine retains a considerable share of the peculiar rank smell of this sort of aloes, but its taste is not much more unpleasant than that of the extractive obtained from the two other sorts.

Medical use.—Aloes is a bitter stimulating purgative, exerting its action chiefly on the rectum. In doses of from 5 to 15 grains it empties the large intestines, without making the stools thin; and likewise warms the habit, quickens the circulation, and promotes the uterine and hæmorrhoidal fluxes. If given in so large a dose as to purge effectually, it often occasions an irritation about the anus, and sometimes a discharge of blood.

It is frequently employed in cases of suppression of the menses, or of the hæmorrhoidal discharge; but it is particularly serviceable in habitual costiveness, to persons of a phlegmatic temperament and sedentary life, and where the stomach is oppressed and weakened. It has, however, a tendency to induce and augment hæmorrhoidal affections; and with those who are liable to such complaints, it should be avoided. In dry bilious habits aloes proves injurious, immoderately heating the body, and inflaming the bowels.

Some are of opinion, that the purgative virtue of aloes resides entirely in its resin; but experience has shewn, that the pure resin has little or no purgative quality, and that the extractive part separated from the resinous, acts more powerfully than the crude aloes. If the aloes indeed be made to undergo long coction in the preparation of the gummy extract, its cathartic power will be considerably lessened, not from the separation of the resin, but from an alteration made in the extractive itself by the action of the heat and air. The strongest vegetable cathartics become mild by a like treatment.

Socotorine aloes, as already observed, contains more extractive

than the hepatic; and hence is likewise found to purge more, and with greater irritation. The first sort, therefore, is most proper where a stimulus is required, as for promoting or exciting the menstrual flux; whilst the latter is better calculated to act as a common purge.

Aloes are administered either

a. Simply, or

b. In composition:

1. With purgatives. Soap, scammony, colocynth, rhubarb.
2. With aromatics. Canella.
3. With bitters. Gentian.
4. With emmenagogues. Iron, myrrh.

They are exhibited in the form of

a. Powder; too nauseous for general use.

b. Pill; the most convenient form.

c. Solution in wine or diluted alcohol.

Off. prep. Pulv. cum canella, *Lond.*—cum Guaiaco, *Lond.*—cum ferro, *Lond.*—Pil. Scam. comp. cum aloe, *Lond.* Pilulæ, *Ed. Lond. Dub.*—cum assa foet. *Ed.*—cum colocynth, *Ed.*—cum myrrha, *Lond. Ed.* Pil. rhei comp. *Ed.* Extract, *Dub.* Extract coloc. comp. *Lond.* Tinct. *Ed. Lond. Dub.*—cum myrrha, *Ed.* Tinct. benz. comp. *Lond. Ed.* T. rhei cum aloë, *A. Ed.* T. A. æther, *Ed.* Vinum, *Ed. Lond. Dub.*

ALTHÆA OFFICINALIS. (*Ed.*) *Althæa. Lond.*

Marsh-mallow.

Wild. g. 1289. *sp.* 1.—*Monadelphia Polyandria.*—*Nat. ord.* Columnaceæ.

Off. Radix. Folium. The root and leaves.

THE marsh-mallow is a perennial indigenous plant, which is found commonly on the banks of rivers, and in salt marshes.

The whole plant, but especially the root, abounds with mucilage. The roots are about the thickness of a finger, long and fibrous. They are peeled and dried, and then are perfectly white.

From 960 parts of the dry root, Neumann extracted by water 50, and afterwards with alcohol 41; by alcohol applied first 360, and afterwards by water 348. Lewis extracted by alcohol only 20, and he observed that the alcoholic extract was sweeter than the watery, and had the smell peculiar to the root. The substance soluble in this instance, both in alcohol and water, is probably saccharine. From 960 parts of the dry leaves Neumann

extracted by water 340, and then by alcohol 213; by alcohol first 280, and then by water 218. The residuum of the root was only one fourth of the leaves, one half of the whole. The root is therefore the most mucilaginous. The decoction of the root reddens turnsol, and gelatinizes silicized potash.

Med. use.—It is used as an emollient and demulcent, in diseases attended with irritation and pain, as in various pulmonary complaints, and in affections of the alimentary canal and urinary organs; and it is applied externally in emollient fomentations, gargles, and clysters.

Off. prep. Decoct. *Ed.* Syr. *Ed. Lond.*

AMMONIACUM. *Gummi-resina. Lond. Dub. Ed.*

Ammoniacum, a gum-resin.

AMMONIACUM is a concrete, gummy-resinous juice, brought from the East Indies, usually in large masses, composed of little lumps or tears, of a milky colour, but soon changing, upon being exposed to the air, to a yellowish hue. We have no certain account of the plant which affords this juice; it is said to grow in Nubia, Abyssinia, and the interior of Egypt; the seeds usually found among the tears resemble those of the umbelliferous class, and it is not improbable that it is an exudation from a species of *ferula*. Such tears as are large, dry, free from little stones, seeds or other impurities, should be picked out and preferred for internal use; the coarser kind is purified by solution, colature, and careful inspissation; but unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts. There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue.

Ammoniacum has a nauseous sweet taste, followed by a bitter one; and a peculiar smell, somewhat like that of galbanum, but more grateful: it softens in the mouth, and grows of a white colour upon being chewed. It softens by heat, but is not fusible: when thrown upon live coals, it burns away in flame; it is in some degree soluble in water and in vinegar, with which it assumes the appearance of milk; but the resinous part, amounting to about one half, subsides on standing.

Neumann extracted from 480 parts, 360 by alcohol, and then by water 105; by water applied first 410, and then by alcohol 60. Alcohol distilled from it arose unchanged, but water acquired a sweetish taste, and the smell of the ammoniac. The solution in alcohol is transparent; but on the addition of water, becomes milky. It therefore seems to consist principally of a substance soluble both in water and in alcohol, combined with some volatile matter.

Medical use.—The general action of gum-ammoniac is stimulant. On many occasions, in doses of from ten to thirty grains, it proves a valuable antispasmodic, deobstruent, or expectorant. In large doses it purges gently, excites perspiration, and increases the flow of urine. It is used with advantage to promote expectoration, in some pulmonary diseases; in dropical affections, to augment the flow of urine, and to support the salivation in small pox. It is also an useful deobstruent; and is frequently prescribed for removing obstructions of the abdominal viscera, and in hysterical disorders, occasioned by a deficiency of the menstrual evacuations. In long and obstinate colics, proceeding from viscid matter lodged in the intestines, this gummy resin has produced happy effects after purges and the common carminatives had been used in vain. Externally, it is supposed to soften and ripen hard tumours. A solution of it in vinegar has been recommended by some for resolving even scirrhus swellings.

It is exhibited internally,

- a. In solution, combined with vinegar, vinegar of squills, assa foetida, &c.
- b. In pills, with bitter extracts, myrrh, assa foetida.
- c. And externally, combined with vinegar, turpentine, common plaster, &c.

Off. prep.—Ammon. purif. *Lond.* Lac am. *Lond. Dub.* Pil. Scill. *Ed. Lond. Dub.* Emp. gum. *Ed.* Empl. A. cum hydrarg. *Lond.*

AMOMUM.

Willd. g. 4.—*Monandria Monogynia.*—*Nat. ord. Scitaminea.*

Sp 1. AMOMUM ZINGIBER, *Ed. Zingiber, Lond. Dub.*

Ginger.

Off—Radix ficcata. Radix condita ex India allata. The dried root, and the preserved root brought from India.

GINGER is a perennial plant, indigenous in the East Indies, but now cultivated in the West-India islands. It is cultivated there very much in the same manner as potatoes are here, and is fit for digging once a-year, unless for preserving in syrup, when it should be dug at the end of three or four months, at which time it is tender and full of sap.

Ginger is distinguished into two sorts, the black and the white. The former is rendered fit for preservation by means of boiling water, the latter by insolation; and as it is necessary to select the fairest and roundest sorts for exposure to the sun, white ginger is commonly one third dearer than black.

Black ginger consists of thick and knotty roots, internally of an

orange or brownish colour, externally of a yellow-grey. White ginger is less thick and knotty, internally of a reddish-yellow, and externally of a whitish-grey or yellow. It is firm and resinous, and more pungent than the black. Pieces which are worm-eaten, light, friable, or soft, and very fibrous, are to be rejected.

Candied ginger should be prepared in India, from the young and succulent roots. When genuine, it is almost transparent. That manufactured in Europe is opaque and fibrous.

Ginger has a fragrant smell, and a hot, biting, aromatic taste. Neumann obtained by distillation with water from 7680 parts of white ginger, about 60 of a volatile oil, having the smell and distinguishing flavour of the ginger, but none of its pungency. The watery extract was considerably pungent, and amounted to 2720, after which alcohol extracted 192 of a very pungent resin. Alcohol applied first extracted 660 of pungent resin, and water afterwards 2160 of a mucilaginous extract, with little taste, and difficultly exsiccated. The black ginger contained less soluble matter than the white.

Medical use.—Ginger is a very useful spice in cold flatulent colics, and in laxity and debility of the intestines; it does not heat so much as those of the pepper kind, but its effects are more durable. It may also be applied externally as a rubefacient.

Off. prep.—Syr. *Ed.* Tinct. *Lond.* It is also an ingredient in pulv. arom. *Lond. Dub. Ed.* Pulv. scam. comp. *Lond. Dub.* Pulv. scam. cum aloe, *Lond.* Pulv. fennæ comp. *Lond.* Elect. arom. *Dub.* Elect. scammon. *Lond. Dub.* Confectio opiat. *Lond.* Troch. magnes. *Lond.* Pil. aloet. *Dub.* Pil. scill. *Lond. Dub.* Infus. fennæ, *Lond. Dub.* Syr. spin. cerv. *Lond.* Tinct. cinnam. comp. *Lond. Dub.* Vin. aloes, *Ed.* Acid. sulph. aromat. *Ed.*

Sp. 3. AMOMUM ZEDOARIA. Dub.

Long Zedoary.

Off.—Radix. The root.

THE zedoary is perennial, and grows in Ceylon and Malabar. The roots come to us in pieces, some inches in length, and about a finger thick. Externally they are wrinkled, and of an ash-grey colour, but internally are brownish-red. The best kind comes from Ceylon, and should be firm, heavy, of a dark colour within, and neither worm-eaten nor very fibrous. It has an agreeably fragrant smell, and a warm, bitterish, aromatic taste.

In distillation with water, it yields a volatile oil, heavier than water, possessing the smell and flavour of the zedoary in an eminent degree; the remaining decoction is almost simply bitter. Spirit likewise brings over some small share of its flavour: nevertheless, the spiritous extract is considerably more grateful than the zedoary itself. From 7689 parts Neumann got 2720 of watery

extract, and afterwards 140 of almost insipid resin; by applying alcohol first, 720, and water afterwards, 2400, much bitterer than the original watery extract.

Off. prep.—Confect. aromat. *Lond.*

Sp. 7. AMOMUM CARDAMOMUM. Cardamomum Minus. Dub.

Sp. 10. ————— REPENS. Ed. Cardamomum Minus. Lond.

Lesser Cardamom seeds.

Off.—Semen.

The London and Edinburgh colleges, on the authority of Sonnerat, have supposed these seeds to be the product of the latter species, while the Dublin college, with Murray, Willdenow, and all the foreign pharmaceutical writers, ascribe them to the former. Both species are natives of India.

Cardamom seeds are a very warm, grateful, pungent aromatic, and frequently employed as such in practice: they are said to have this advantage, that, notwithstanding their pungency, they do not, like those of the pepper kind, immoderately heat or inflame the bowels. Both water and rectified spirit extract their virtues by infusion, and elevate them in distillation; with this difference, that the tincture and distilled spirit are considerably more grateful than the infusion and distilled water: the watery infusion appears turbid and mucilaginous, the tincture limpid and transparent. From 480 parts Neumann got about 20 of volatile oil, 15 of resinous extract, and 45 of watery. The husks of the seeds, which have very little smell or taste, may be commodiously separated, by committing the whole to the mortar, when the seeds will readily pulverize, so as to be freed from the shell by the sieve: this should not be done till just before using them; for if kept without the husks, they soon lose considerably of their flavour.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct. sennæ, *Lond. Dub.* Tinct. gent. comp. *Lond.* Tinct. cinnam. comp. *Ed. Lond. Dub.* Tinct. rhei, *Ed. Lond.* Tinct. rhei cum aloë, *Ed.* Vin. aloës, *Ed.* Vin. rhab. *Lond.* Extr. coloc. comp. *Lond.* Pulv. arom. *Ed. Lond. Dub.* Confect. aromat. *Lond.* Pil. scill. *Ed.*

AMYGDALUS COMMUNIS. *Ed.*

a. *Amygdalus dulcis. Ed. Amygdala dulces. Lond. Dub.*

b. *Amygdala amara. Lond.*

Off.—Nucleus. The kernel. The almond tree.

Willd. g. 981, sp. 2. Icosandria Monogynia—Nat. ord. *Pomaceæ.*

THE fruit which affords those kernels is the produce of a tree nearly resembling the peach. It originally came from Syria and Barbary, but is now much cultivated in the south of Europe,

The eye distinguishes no difference betwixt the trees which produce the sweet and bitter, or betwixt the kernels themselves; it is said that the same tree has, by a difference in culture, afforded both.

The almond is a flattish kernel, of a white colour, and of a soft sweet taste, or a disagreeable bitter one. The skins of both sorts are thin, brownish, unpleasant, and covered with an acrid powdery substance. They are very apt to become rancid on keeping, and to be preyed on by a kind of insect, which eats out the internal part, leaving the almond to appearance entire. To these circumstances regard ought to be had in the choice of them.

Sweet almonds are of greater use in food than as medicine, but they are reckoned to afford little nourishment; and when eaten in substance, are not easy of digestion, unless thoroughly comminuted. They are supposed, on account of their unctuous quality, to obtund acrimonious juices in the *primæ viæ*: peeled sweet almonds, eaten six or eight at a time, sometimes give present relief in the heartburn.

Bitter almonds have been found poisonous to dogs and some other animals; and a water distilled from them, when made of a certain degree of strength, has had the same effects. Nevertheless, when eaten, they appear innocent to most men, and are every day used in cookery, on account of their agreeable flavour; but there are some habits, in which the smallest quantity produces urticaria, and other unpleasant symptoms. The similarity of the smell of bitter almonds to prussic acid, led Mr. Schrader to suppose, that it was owing to the presence of this acid: and it is said that he has found his supposition correct; and that prussic acid is equally poisonous with the bitter distilled waters.

Both sorts of almonds yield, on expression, a large quantity of oil, which separates likewise, upon boiling the almonds in water, and is gradually collected on the surface.

The oils obtained by expression from both sorts of almonds are in their sensible qualities the same. They should be perfectly free from smell and taste, and possess the other properties of fixed oils.

Medical use.—The general virtues of these oils are, to blunt acrimonious humours, and to soften and relax the solids: hence their use internally, in tickling coughs, heat of urine, pains and inflammations; and externally, in tension and rigidity of particular parts. On triturating almonds with water, the oil and water unite together, by the mediation of the other matter of the kernel, and form an unctuous milky liquor.

The milky solutions of almonds in watery liquors, commonly called emulsions, contain the oil of the subject, and participate in some degree of its emollient virtue; but have this advantage

above the pure oil, that they may be given in acute or inflammatory disorders, without danger of the ill effects which the oil might sometimes produce; since emulsions do not turn rancid or acrimonious by heat, as all the oils of this kind in a little time do. As the bitter almond imparts its peculiar taste when treated in this way, the sweet almonds are employed in making emulsions.

Several unctuous and resinous substances, of themselves not miscible with water, may, by trituration with almonds, be easily mixed with it into the form of an emulsion; and are thus excellently fitted for medicinal use. In this form camphor, and the resinous purgatives, may be commodiously taken.

Off. prep.—*Oleum fixum*, *Ed. Lond. Dub.* *Emulsio*, *Ed. Lond. Dub.* *Emulsio arab.* *Ed. Dub.* *Emulsio camph.* *Ed. Lond.*

AMYRIS.

Willd. g. 755. *Ostandia Monogynia*.—*Nat. ord.* *Dumosæ*.

Sp. 2. AMYRIS ELEMIFERA. *Elemi.* *Lond. Dub.*

Elemi. A resin.

Off.—*Resina.* The resin.

THE tree which furnishes elemi grows in Carolina and Spanish America. In dry weather, and especially at full moon, incisions are made in the bark, from which a resinous juice flows, and is left to harden in the sun. It is brought to us in long roundish cakes, generally wrapped up in flag leaves. The best sort is softish, somewhat transparent, of a pale whitish yellow colour, inclining a little to green, of a strong, not unpleasant smell, resembling somewhat that of fennel. Dr. Wright says, that on wounding the *bursera gummifera*, a thick milky liquor flows, which soon concretes into a resin no way different from the elemi of the shops. Of one hundred parts ninety-four dissolve in alcohol, and part of its fragrance rises along with this menstruum in distillation: distilled with water it yields 6.4 of pale-coloured, thin, fragrant, essential oil: its only constituents, therefore, are resin and essential oil. It gives name to one of the officinal unguents, and is at present scarce any otherwise made use of; though it is certainly preferable for internal purposes to some others which are held in greater esteem.

Off. prep.—*Ungt. elemi*, *Lond. Dub.*

Sp. 13. AMYRIS ZEYLANICA.

The elemi which comes from the East-Indies is said to be the produce of this species.

Sp. 6. AMYRIS GILEADENSIS.

Off.—*Refina liquida. Ed.* Balsamum Gileadense. Balsam of Gilead. A liquid resin.

THIS article, which has also had the name of Balsamum Judaicum, Syriacum, de Mecca, Opo-balsamum, &c. is a resinous juice, obtained from an evergreen tree, growing spontaneously, particularly near to Mecca, on the Asiatic side of the Red sea. The true opo-balsamum, according to Alpinus, is at first turbid and white, of a very strong pungent smell, like that of turpentine, but much sweeter; and of a bitter, acrid, astringent taste: upon being kept for some time, it becomes thin, limpid, of a greenish hue, then of a gold yellow, and at length of the colour of honey.

This balsam is in high esteem among the eastern nations, both as a medicine, and as an odoriferous unguent and cosmetic. But in Europe it is never obtained genuine; and as all the signs of its goodness are fallacious, it has been very rarely employed. Nor need we regret it; for any of the other resinous fluids, such as the balsam of Canada or Capaiba, will answer every purpose full as well.

The dried berries of this tree were formerly kept under the title of Carpo-balsamum, and the dried twigs under that of Xylo-balsamum. Although Willdenow has inserted the amyris opo-balsamum as a distinct species, he thinks they are the same.

ANAS ANSER. Adeps Anserinus. Dub.

The goose. The fat.

THE specific properties of the different kinds of fat are now very generally disbelieved: and therefore almost the only kinds in use are those of the domestic animals, which are easily procured. Goose fat is soft and very greasy. It is very rarely used in medicine, as it possesses no advantage over axunge.

ANCHUSA TINCTORIA. Ed. Anchusa. Dub.

Alkanet.

Off.—*Radix.* The root.

Willd. g. 277. sp. 7. Pentandria Monogynia.—*Nat. ord. Asperifolia*

THIS plant is a native of Europe: it is sometimes cultivated in our gardens; but the greatest quantities are raised in Germany or France, particularly about Montpellier, from whence the dried roots are usually imported to us. The alkanet root produced in England is much inferior in colour to that brought from abroad; the English being only lightly reddish, the others of a deep purp-

lish red; and it has been suspected, but without sufficient foundation, that the foreign roots owe part of their colour to art. The cortical part of the root is of a dusky red, and imparts an elegant deep red to alcohol, oils, wax, and all unctuous substances, but not to watery liquors.

Alkanet root has little or no smell; when recent, it has a bitterish astringent taste, but when dried scarcely any. As to its virtues, the present practice expects not any from it. Its chief use is for colouring oils, ointments, and plasters. As the colour is confined to the cortical part, the small roots are best, having proportionally more bark than the large.

ANETHUM.

Willd. g. 560. *Pentandria Digynia*.—Nat. ord. *Umbellata*.

Sp. 1. ANETHUM GRAVEOLENS. *Lond.*

Dill.

Off.—Semen. The seed.

DILL is an annual umbelliferous plant, cultivated in gardens, as well for culinary as medical use. The seeds are of a pale yellowish colour, in shape nearly oval, convex on one side, and flat on the other. Their taste is moderately warm and pungent; their smell aromatic, but not of the most agreeable kind. The seeds are recommended as a carminative in flatulent colics. The most efficacious preparations of them are the distilled oil, and a tincture or extract made with rectified spirit.

Off. prep.—Aq. dist. *Lond.*

Sp. 3. ANETHUM FOENICULUM. *Ed.* *Foeniculum dulce*. *Lond.*
Dub.

Sweet fennel.

Off. Semen. The root and seeds.

THIS is a biennial plant, of which there are four varieties. One of these, the common fennel, is indigenous to England. The sweet fennel, the variety which is officinal, grows wild in Italy, but is also cultivated in our gardens. It is smaller in all its parts than the common, except the seeds, which are considerably larger. The seeds of the two sorts differ likewise in shape and colour. Those of the common are roundish, oblong, flattish on one side, and protuberant on the other, of a dark almost blackish colour; those of the sweet are longer, narrower, not so flat, generally crooked, and of a whitish or pale yellowish colour.

The seeds of both the fennels have an aromatic smell, and a moderately warm pungent taste: those of the *fœniculum dulce* are in flavour most agreeable, and have also a considerable degree of sweetness.

From 960 parts, Neumann obtained 20 of volatile oil, 260 watery extract, and afterwards some alcoholic extract, which could not be exsiccated, on account of its oiliness. By alcohol first he got 84 resinous extract, 120 fixed oil, and then by water 120 of a bitter extract.

Off. prep.—Aqua dest. femin. *Lond. Dub.* Oleum volat. femin. *Dub.* O. v. flor. *Dub.* Decoct. cham. *Dub.*

ANGELICA ARCHANGELICA. *Ed. Angelica. Lond. Dub. Angelica.*

Off.—Radix, caulis, folium, semen. The root, stalk, leaves, and seeds.

Willd. g. 543. *sp.* 1. *Pentandria Digynia.*—*Nat. ord. Umbellatæ.*

ANGELICA is a large biennial umbelliferous plant. It grows spontaneously on the banks of rivers in Alpine countries; but for the use of the shops, it is cultivated in gardens in different parts of Europe.

All the parts of Angelica, especially the roots, have a fragrant aromatic smell; and a pleasant bitterish warm taste, glowing upon the lips and palate for a long time after they have been chewed. The flavour of the seeds and leaves is very perishable, particularly that of the latter, which, on being barely dried, lose the greatest part of their taste and smell: the roots are more tenacious of their flavour, though they lose part of it with keeping. The fresh root, wounded early in the spring, yields an odorous yellow juice, which, slowly exsiccated, proves an elegant gummy resin, very rich in the virtues of the angelica. On drying the root, this juice concretes into distinct molecu^{læ}, which, on cutting it longitudinally, appear distributed in little veins; in this state, they are extracted by alcohol, but not by watery liquors. Angelica roots are apt to grow mouldy, and to be preyed on by insects, unless thoroughly dried, kept in a dry place, and frequently aired. We apprehend, that the roots which are subject to this inconvenience, might be preserved, by dipping them in boiling spirit, or exposing them to its steam, after they are dried. Baumé says, that it is only the roots gathered in the spring that are subject to this inconvenience, and that when gathered in the autumn, they keep good several years. Roots only worm-eaten are as fit as ever for making a tincture, or affording volatile oil.

Angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice. The root, which is the most efficacious part, is used in the aromatic tincture. The stalks make an agreeable sweetmeat.

Off. prep.—Spirit anisi comp. *Lond.*

ANGUSTURA. *Cortex. Ed. Dub.*

The natural history of this bark is but imperfectly known. The first parcel of it was imported from Dominica in July 1788, with an account, "that it had been found superior to the Peruvian bark in the cure of fevers." Subsequent importations from the Spanish West Indies, either immediately or through the medium of Spain, render it probable that it is the produce of South America; and I have somewhere read that Humboldt, in his late travels in South America, discovered it to be the produce of a species of cinchona: we may now, therefore, expect to get further information respecting its natural history.

Its appearance varies, accordingly, as it has been taken from larger or smaller branches. The outer surface is more or less wrinkled, and of a greyish colour, and the inner surface is of a dull brown. Its substance is of a yellowish-brown colour. Its fracture is short and resinous. Its taste is intensely bitter, and slightly aromatic, leaving a strong sense of heat and pungency in the throat and fauces. The odour is peculiar. The powder is yellow.

According to the experiments related by Mr. Brande, from 3840 parts of angustura, there were extracted by alcohol, 144 of resin, and 300 of an acrid unctuous substance, the residuum yielded to water 1500 of dry gummy extract. Treated first with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards, 161 of a resin of a light brown colour, and extremely acrid. By distillation it gave 26 of essential oil. The tincture is of a deep yellow colour, reddens infusion of turnsole, and becomes turbid and white on admixture with water. By repeated filtration a brownish resin is separated, and the transparent fluid has a pale yellow colour. I find that it is not precipitated by solution of gelatin, but by infusion of galls. It therefore does not contain tannin but cinchonin, and it has the peculiar property of acquiring a deep red colour with red sulphate of iron, and depositing a purplish slate-coloured precipitate.

Med. use.—As an aromatic bitter, it acts as a tonic and stimulant of the organs of digestion. It increases the appetite for food, removes flatulence and acidity arising from dyspepsia, and is a very effectual remedy in diarrhoea proceeding from weakness of the bowels, and in dysentery; and it possesses the singular advantage of not oppressing the stomach, as cinchona is apt to do. It does not cure intermittents.

It is exhibited, 1. In powder, in doses of from 5 to 20 grains, either alone or with rhubarb, magnesia, or carbonate of lime,

2. In infusion. The infusion of one drachm in four ounces of water may be used daily.

3. In tincture.

4. In watery extract.

ANTHEMIS.

Willd. g. 1517. Syngenesia Polygamia Superflua.—Nat. ord. *Compositæ Radiatæ.*

Sp. 15. ANTHEMIS NOBILIS. Ed. Chamæmelum Flores. Lond. Dub.

Chamomile.

Off.—Herba et flos. The herb and flowers.

CHAMOMILE is a perennial plant, indigenous in the south of England, but cultivated in our gardens for the purposes of medicine. The flowers have a strong, not ungrateful, aromatic smell, and a very bitter nauseous taste.

Their active constituents are bitter extractive, and essential oil. To the latter is to be ascribed their antispasmodic, carminative, cordial, and diaphoretic effects; to the former, their influence in promoting digestion.

Neumann obtained from 480 parts, 180 of alcoholic extract, and afterwards 120 of watery; and reversing the procedure, 240 of watery, and 60 alcoholic.

Med. use.—Chamomile flowers are a very common and excellent remedy, which is often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menstrual discharge, in the vomiting of puerperal women, in the afterpains, in gout, in podagra, in intermittents, and in typhus.

As chamomile excites the peristaltic motion, it is useful in dysentery, but is not admissible in all cases of diarrhoea. From its stimulating and somewhat unpleasant essential oil, chamomile is also capable of exciting vomiting, especially when given in warm infusion; and in this way is often used to assist the action of other emetics.

Externally, chamomile flowers are applied as a discutient and emollient, in the form of clyster or embrocation, in colic, dysentery, and strangulated hernia, &c.

Chamomile flowers are exhibited,

1. In substance, in the form of powder, or rather of electuary, in doses of from half a drachm to two drachms, either alone, or combined with Peruvian bark, as for the cure of intermittent fevers.

2. In infusion, in the form of tea. This may either be drunk warm, for promoting the action of emetics, or cold, as a stomachic.

3. In decoction or extract. These forms contain only the extractive, and therefore may be considered as simple bitters.

4. The essential oil may be obtained by distillation. This possesses the antispasmodic powers in a higher degree than the simple flowers, but on the contrary, does not possess the virtues depending on the presence of the bitter extractive.

Off. prep.—Decoct. *Ed. Lond. Dub.* Extract, *Lond. Ed. Dub.*

Sp. 25. *ANTHEMIS PYRETHRUM. Ed. Pyrethrum. Lond. Dub.*
Pellitory of Spain.

Off.—Radix. The root.

THIS plant, though a native of warm climates, as Barbary, bears the ordinary winters of this country, and often flowers successively from Christmas to May: the roots also grow larger with us than those with which the shops are usually supplied from abroad. They are seldom so big as the little finger, and the best are dry compact, of a brown colour, and not easily cut with a knife.

Pellitory root has no sensible smell; its taste is very hot and acrid, but less so than that of arum; the juice expressed from it has scarce any acrimony, nor is the root itself so pungent when fresh, as after it has been dried. Neumann obtained from 960 parts of the dry root, only 40 of alcoholic extract, and afterwards 570 of watery, and by a reverse procedure, 600 of watery, and 20 of alcoholic extract. Both the alcoholic extracts were excessively pungent. Its acrimony, therefore, was derived from a resin.

Med. use.—The principal use of pyrethrum in the present practice is as a masticatory, for promoting the salival flux, and evacuating the viscid humours from the head and neighbouring parts; by this means it often relieves the toothach, some kinds of pains of the head, and lethargic complaints. A vinous infusion is also useful in debility of the tongue.

ANTIMONIUM. *Stibium.*

Antimony.

The physical and chemical properties of this metal have been already described.

Antimony is found,

I. In its metallic state, at Stahlberg in Sweden, and Allemont in France.

II. Mineralized with sulphur.

1. Grey antimony.

a. Compact.

b. Foliated.

c. Striated (74 antimony, 29 sulphur, Bergmann.)

- d. Plumose (sulphuret of antimony with arsenic and iron, Berg.)
- 2. Red antimony (hydroguretted sulphuret of antimony).
- III. Oxidized. Mongez.
- IV. Acidified.
 - 1. Muriated.
 - 2. Phosphated. Yellow ore of antimony, Razumoufky.

The grey ore of antimony is the state in which it is officinal, and also that in which it is most commonly found.

SULPHURETUM ANTIMONII. Ed. *Antimonium.* Lond.
Stibium. Dub.

Sulphuret of antimony.

Whatever opinion may be formed of the nomenclature adopted by the Edinburgh college in general, the propriety of the change which they have introduced in this and similar instances cannot be disputed; for while chemists, according to rational principles, designated simple substances by simple names, the same names continued to be given by pharmaceutical writers to compound states of these bodies. To have established, therefore, an uniformity of nomenclature in sciences so intimately allied, cannot fail to be considered as an improvement of the greatest importance.

Although sulphuretted antimony be a natural production, yet it is commonly sold in the form of loaves, which have been separated from the stony, and other impurities of the ore, by fusion, and a species of filtration. For the ore is melted in conical well-baked earthen pots, having one or more small holes in their apices. The fire is applied round and above these pots; and as soon as the sulphuretted antimony melts, it drops through the holes into vessels placed beneath to receive it, while the stony and other impurities remain behind. As antimony is very volatile, the mouths and joinings of the pots must be closed and luted. The upper part of the loaves thus obtained is more spongy, lighter, and impure than the lower, which is therefore always to be preferred. These loaves have a dark-grey colour externally, but on being broken, they appear to be composed of radiated striæ, of a metallic lustre, having the colour of lead. The goodness of the loaves is estimated from their compactness and weight, from the largeness and distinctness of the striæ, and from their being entirely vaporizable by heat. Lead has been sold for antimony; but its texture is rather foliated than striated, and it is not vaporizable. The presence of arsenic, which renders the antimony useless for medical purposes, is known by its emitting the smell of garlic when thrown upon live coals, and by other tests mentioned under

arsenic. The presence of manganese or iron is known by their not being volatilized by a red heat.

Antimony is obtained from its ores by gradually detonating in a large crucible four parts of sulphuretted antimony, three of crude tartar, and one and a half of dry nitrate of potash, reduced to a fine powder, and intimately mixed. The detonated mass is then to be fused, and poured into a heated mould, greased with a little fat, in which it is allowed to consolidate. It is then turned out, and the scoriæ are separated from the antimony, which will weigh about one fourth part of the sulphuret employed. The scoriæ are a mixture of sulphuret of potash and of antimony, and may be preserved for other purposes.

Another method of obtaining antimony, is by melting three parts of sulphuretted antimony with one of iron. The sulphur quits the antimony, and combines with the iron.

Formerly antimony was given internally; but as its action depended entirely on the acid it met with in the stomach, its effects were very uncertain, and often violent. Cups were also made of antimony, which imparted to wine that stood in them for some time an emetic quality. But both these improper modes of exhibiting this metal are now laid aside.

Med. use.—Sulphuretted antimony was employed by the ancients in collyria, against inflammations of the eyes, and for staining the eye-brows black. Its internal use does not seem to have been established till towards the end of the fifteenth century; and even at that time it was by many looked upon as poisonous. But experience has now fully evinced, that it has no noxious quality, being often used, particularly in chronic eruptions; that some of the preparations of it are medicines of great efficacy; and that though many of them are most violently emetic and cathartic, yet even these, by a slight alteration or addition, lose their virulence, and become mild in their operation.

Off. prep.—Antimony is at present the basis of many officinal preparations, to be afterwards mentioned. But besides those still retained, many others have been formerly in use, and are still employed by different practitioners. The following table, drawn up by Dr. Black, exhibits a distinct view of the whole.

DR. BLACK'S TABLE of the PREPARATIONS of ANTIMONY.

Medicines are prepared either from crude antimony, or from the pure metallic part of it called regulus.

From CRUDE ANTIMONY.

I. By trituration.

Antimonium præparatum. Lond.

II. By the action of heat and air.

Flores antimonii fine addito.

Vitrum antimonii. Ed.

Antimonium vitrificatum. Lond.

Vitrum antimonii ceratum. Ed.

III. By the action of alkalies.

Hepar antimonii mitissimum.

*Regulus antimonii medicinalis.*Hepar ad kermes minerale. *Geoffroi.*

Hepar ad tinct. antimonii.

Kermes minerale.

Sulphur antimonii præcipitatum. Ed. et Lond.

IV. By the action of nitre.

Crocus antim. mitissimus, *vulgo Regulus antim. medicinalis.*

Crocus antimonii. Ed. et Lond.

Antimonii emeticum mitius. Boerh.

Antim. ustum cum nitro, *vulgo Calx antimonii nitrata.* Ed.Antimonium calcinatum. Lond. *Vulgo Antimonium diaphoret.*

Antim. calcareo-phosphoratum, sive pulvis antimonialis. Ed.

Pulvis antimonialis. Lond.

V. By the action of acids.

Antim. vitriolat. Klaunig.

Antim. cathartic. Wilson.

Antimonium muriatum, *vulgo Butyrum antim.* Ed.*Antimonium muriatum.* Lond.Pulvis algarothi, sive *Mercurius Vita.*

Bezoardicum minerale.

Antimonium tartarifatum, *vulgo Tartarus emeticus.* Ed.*Antimonium tartarifatum.* Lond.

Vinum antimonii tartarifati. Ed. et Lond.

Vinum antimonii. Lond.

From the REGULUS.

This metal, separated from the sulphur by different processes, is called *Regulus antimonii simplex*, *Regulus martialis*, *Regulus jovialis*, &c. From it were prepared,

I. By the action of heat and air,

Flores argentei, sive nix antim.

II. By the action of nitre,

Cerussa antimonii.

Stomachicum Poterii.

Antihecticum Poterii.

Cardiacum Poterii.

PREPARATIONS which have their name from ANTIMONY, but scarcely contain any of it.

Cinnabaris antimonii.

Tinctura antimonii.

To this table of Dr. Black's, which is left unaltered, I shall add another, not taken from the mode of preparation, but from the nature of the product.

ANTIMONY has been exhibited,

I. In its metallic state.

a. Antimonium. Regulus antimonii.

b. Alloyed,

1. With iron. Regulus antimonii martialis.

2. With tin. Regulus antimonii jovialis.

3. With tin and copper. Regulus metallorum.

c. Combined with sulphur.

1. Sulphuretum antimonii. Ed. Antimonium. Lond. Stibium. Dub. Sulph. ant. ppt. E. L. D.

2. Regulus antimonii medicinalis. Maët. Febrifugum Craanii.

II. Oxidized,

a. Protoxide.

1. Calx antimonii *per se*. Cinis antimonii.

2. Flores antimonii argentini.

3. Calx stibii præcip. D. Pulvis algarothi.

4. Combined with sulphuret of antimony.

a. Oxidum antimonii cum sulphure vitrificatum. E. Antim. vitrif. L. Vitrum antimonii.

Melted with wax. Oxidum antimonii vitrif. cum cera. E.

b. Oxidum antimonii cum sulph. per nitrat. potassæ, E. Stibium nitro calin at. D. Crocus antimonii. L. Crocus metallorum. Hepar antim.

5. Combined with sulphuretted hydrogen. Sulphuret. ant. præcip. E. Sulph. ant. præcip. L. Sulph. stibiat. rufum, D. Sulphur auratum antimonii.

6. With hydroguretted sulphur. Sulphur stibiat. fuscum, D. Kermes minerale.

7. With muriatic acid. Murias antim. E. Ant. mur. L. Stib. muriat. caust. D. Butyrum antimonii.

8. With tartaric acid and potash. Tartris antimonii, E. Ant. tart. L. Tart. stibiat. D. Tartarus emeticus.

Dissolved in wine. Vinum tart. ant. E. Vin. tart. stib. D. Vin. ant. tart. L. Vin. ant. L. Vinum antimoniale.

9. With phosphate of lime. Oxidum antimonii cum phosphate calcis, E. Pulv. ant. L. Pulv. stib. D. *James's powders.*

b. Peroxide.

Antimonium calcinatum. Lond.

These are the principal preparations of antimony. In estimating their comparative value, we may attend to the following observations. All the metallic preparations are uncertain, as it entirely depends on the state of the stomach, whether they have no action at all, or operate with dangerous violence. The sulphure is exposed, though in a less degree, to the same objections.

The preparations in which antimony is in the state of peroxide, are perfectly insoluble in any vegetable or animal acid, and are also found to be inert when taken into the stomach.

The remaining preparations of antimony, or those in which it is in the state of protoxide, are readily soluble in the juices of the stomach, and act in very minute doses. Of its saline preparations, only those can be used internally which contain a vegetable acid; for its soluble combinations with the simple acids are very acrid and corrosive. In general, the surest and best preparations of antimony are those which contain a known quantity of the metal in its state of protoxide.

The general effects of antimonials are, in small doses, diaphoresis, nausea; in large doses, full vomiting and purging. Some allege that antimonials are of most use in fevers when they do not produce any sensible evacuation, as is said to be the case sometimes with James's powder. They therefore prefer it in typhus and emetic tartar in synochus, in which there is the appearance at first of more activity in the system, and more apparent cause for evacuation.

APIUM PETROSELINUM. (Ed.) *Petroselinum.* (Lond.) Parsley.

Off.—Radix, semen. The root and seed.

Willd. g. 563. sp. 1. Pentandria Digynia.—Nat. ord. *Umbellata*

PARSLEY is a biennial plant, and a native of the South of Europe. It is very generally cultivated in this country for culinary purposes. The seeds have an aromatic flavour, and are occasionally made use of as carminatives. The taste of the root is somewhat sweetish, with a light degree of warmth and aromatic flavour, and it possesses gentle diuretic properties.

AQUA.

Water.

WATER does not enter the list of *materia medica* of any of the colleges, but it is so important an agent, both in the cure of disease, and in the practice of pharmacy, that a brief account of its varieties and properties can scarcely be considered as superfluous.

The chemical properties of water have been already enumerated. The purest natural water is snow, or rain water, collected in the open fields; that which falls in towns, or is collected from the roofs of houses, is contaminated with soot, animal effluvia, and other impurities, although after it has rained for some time, the quantity of these diminishes so much, that Morveau says that it may be rendered almost perfectly pure by means of a little barytic water, and exposure to the atmosphere. Rain water, after it falls, either remains on the surface of the earth, or penetrates through it until it meet with some impenetrable obstruction to its progress, when it bursts out at some lower part, forming a spring or well. The water on the surface of the earth either descends along its declivities in streams, which gradually wearing channels for themselves, combine to form rivers, which at last reach the sea, or remain stagnant in cavities of considerable depth, forming lakes or ponds, or on nearly level ground forming marshes.

The varieties of spring water are exceedingly numerous; but they may be divided into the soft, which are sufficiently pure to dissolve soap, and to answer the purposes of pure water in general; the hard, which contain earthy salts and decompose soap, and are unfit for many purposes, both in domestic economy and in manufactures; and the saline, which are strongly impregnated with soluble salts. When spring waters possess any peculiar character, they are called mineral waters. River water is in general soft, as it is formed of spring water, which by exposure becomes more pure; and running surface water, which although turbid from particles of clay suspended in it, is otherwise very pure. Lake water is similar to river water. The water of marshes on the contrary is exceeding impure, and often highly fetid, from the great proportion of animal and vegetable matters which is constantly decaying in them.

Mineral waters derive their peculiarity of character in general, either from containing carbonic acid, or soda, not neutralized, sulphuretted hydrogen, purging salts, earthy salts, or iron, or from their temperature exceeding in a greater or less degree that of other surrounding bodies. The following are the most celebrated :

- a. Warm springs.—Bath, Bristol, Buxton, Matlock, in England. Barege, Vichy, &c. in France. Aix-la-Chapelle, Borset, Baden, Carlsbad, and Toeplitz, in Germany; and Pisa, Lucca, Baia, and many others in Italy.
- b. Carbonated springs.—Pymont, Seltzer, Spa, Cheltenham, Scarborough.
- c. Alkaline.—Carlsbad, Aix-la-Chapelle, Barege, Toeplitz.
- d. Sulphureous.—Enghien, Lu, Aix-la-Chapelle, Kilburn, Harrowgate, Moffat, and many in Italy.
- e. Purging.—Sea water, Lemington Priors, Harrowgate, Lu, Carlsbad, Moffat, Toeplitz, Epsom, Sedlitz, Kilburn, and all brackish waters.
- f. Calcareous.—Matlock, Buxton, and all hard waters.
- g. Chalybeate.—Hartfell, Denmark, Cheltenham, Pymont, Spa, Tunbridge, Bath, Scarborough, Vichy, Carlsbad, Lemington Priors.

Medical use.—Water is an essential constituent in the organization of all living bodies; and as it is continually expended during the process of life, that waste must be also continually supplied, and this supply is of such importance that it is not left to reason or to chance, but forms the object of an imperious appetite. When taken into the stomach, water acts by its temperature, its bulk, and the quantity absorbed by the lacteals. Water about 60° gives no sensation of heat or cold, between 60° and 45° it gives a sensation of cold followed by a glow and increase of appetite and vigour, below 45 the sensation of cold is permanent and unpleasant, and it acts as an astringent and sedative; above 60 it excites nausea and vomiting, probably by partially relaxing the fibres of the stomach, for when mixed with stimulating substances it has not these effects. In the stomach and in the intestines it acts also by its bulk, producing the effects arising from the distention of these organs; and as the intestinal gases consist of hydrogen gas, either pure or carbonated, or sulphuretted, or phosphuretted, it is probably in part decomposed in them. It likewise dilutes the contents of the stomach and intestines, thus often diminishing their acrimony. It is absorbed by the lacteals, dilutes the chyle and the blood, increases their fluidity, lessens their acrimony, and produces *plethora ad molem*. Its effects in pro-

ducing plethora and fluidity are however very transitory, as it at the same time increases the secretion by the skin and kidneys. Indeed the effects of sudorifics and diuretics depend in a great measure on the quantity of water taken along with them.

Mineral waters have also a specific action depending on the foreign substances which they contain. It is however necessary to remark that their effects are in general much greater than might be expected from the strength of their impregnations, owing probably to the very circumstance of their great dilution, by which every particle is presented in a state of activity, while the lacteals admit them more readily than they would in a less diluted state.

Carbonic acid gas gives to the waters which are strongly impregnated with it a sparkling appearance, and an agreeable degree of pungency. In its effects on the body it is decidedly stimulant, and even capable of producing a certain degree of transient intoxication. It is of great service in bilious complaints, atony of the stomach, nausea, and vomiting, and in all fevers of the typhoid type.

Alkaline waters produce also a tonic effect on the stomach, but they are less grateful. They are particularly serviceable in morbid acidity of the stomach, and in diseases of the urinary organs.

Sulphureous waters are chiefly used in cutaneous and glandular diseases. Their effects are stimulant and heating, and they operate by the skin or bowels.

Purging waters derive their effects from the neutral salts they contain, especially the muriates of soda, lime, and magnesia, and the sulphates of soda and magnesia. They are much more frequently used for a length of time to keep the bowels open by exciting the natural action, than to produce full purging. Used in this way, instead of debilitating the patient, they increase his appetite, health, and strength.

Chalybeate waters are used as tonics. They stimulate considerably, and increase the circulation; but as they also generally contain neutral salts, they act as gentle laxatives. They are used in all cases of debility, cachexia, chlorosis, fluor albus, amenorrhœa, and in general in what are called nervous diseases.

The external use of water depends almost entirely on its temperature, which may be

1. Greater than that of the body, or above 97° F. The hot bath.
2. Below the temperature of the body.
 - a. From 97 to 85, the warm bath.
 - b. From 85 to 65, the tepid bath.
 - c. From 65 to 32, the cold bath.

The hot bath is decidedly stimulant in its action. It renders the pulse frequent, the veins turgid, the skin red, the face flushed, the respiration quick, increases animal heat, and produces sweat. If the temperature be very high, the face becomes bathed in sweat, the arteries at the neck and temples beat with violence, anxiety and a sense of suffocation are induced, and if persisted in, vertigo, throbbing in the head, and apoplexy, are the consequences. It is very rarely employed in medicine, except where there are hot springs, as at Baden in Switzerland. The Russians and some other nations use the hot bath as an article of luxury.

The effects of the affusion of hot water have not been ascertained, and it is probable that when the heat is not so great as to destroy the organization of the skin, the very transient application of the water would be more than counteracted by the subsequent evaporation.

With regard to the action arising from their temperature, all baths below 97° differ only in degree, as they all ultimately abstract caloric from the surface, but with a force inversely as their temperature.

The warm bath excites the sensation of warmth, partly because our sensations are merely relative, and partly because its temperature, though less than that of the internal parts of the body, is actually greater than that of the extremities which are the chief organs of touch. But as water is a much better conductor of caloric than air, and especially than confined air, as much caloric is abstracted from the body by water, which is only a few degrees lower than the internal temperature of the body, as by air of a much lower temperature. The warm bath diminishes the frequency of the pulse, especially when it has been previously greater than natural, and this effect is always in proportion to the time of immersion. It also renders the respiration slower, and lessens the temperature of the body, relaxes the muscular fibre, increases the bulk of the fluids by absorption, removes impurities from the surface, promotes the desquamation and renewal of the cuticle, and softens the nails and indurations of the skin.

The stimulant power of the warm bath is therefore very inconsiderable, and its employment in disease will be chiefly indicated by preternatural heat of the surface and frequency of the pulse, rigidity of the muscular fibre, and morbid affections of the skin. It has accordingly been found serviceable in many cases of pyrexia, both febrile and exanthematous, in many spasmodic diseases, and in most of the impetigines. It is contraindicated by difficulty of breathing, and internal organic affections, and should not be used when the stomach is full.

The affusion of warm water very generally produces a considerable diminution of heat, a diminished frequency of pulse and respiration, and a tendency to repose and sleep; but its effects are not very permanent, and its stimulus is weak. It is recommended in febrile diseases depending on the stimulus of preternatural heat, and in those attended with laborious respiration, and in the paroxysms of hectic fever.

As the tepid bath and affusion produce effects intermediate between those of warm and cold water, it is unnecessary to enumerate them.

The cold bath produces the sensation of cold, which gradually ceases, and is succeeded by numbness. It excites tremors in the skin, and shivering. The skin becomes pale, contracted, and acquires the appearance termed *cutis asserina*. The fluids are diminished in volume, the solids are contracted, the caliber of the vessels is lessened, and therefore numbness and paleness are induced, and the visible cutaneous veins become smaller. There is a sense of drowsiness and inactivity, the joints become rigid and inflexible, and the limbs are affected with pains and spasmodic contractions. The respiration is rendered quick and irregular, the pulse slow, firm, regular, and small; the internal heat is at first diminished, but gradually and irregularly returns nearly to its natural standard; the extremities, however, continue cold and numb, or swollen and livid; the perspiration is suppressed, and the discharge of urine is rendered more frequent and copious. If the cold be excessive on its application, long continued violent shiverings are induced, the pulse ceases at the wrist, the motion of the heart becomes feeble and languid, there is a sensation of coldness and faintness at the stomach, and a rapid diminution of animal heat; and at last, delirium, torpor, and death, are the consequences. If the application of the cold bath be not carried to an excessive length, on emerging from the water, the whole body is pervaded by an agreeable sensation of warmth, and the patient feels refreshed and invigorated.

The primary action of the cold bath is stimulant, and the degree of this action is in proportion to the lowness of its temperature. This opinion is indeed directly opposite to a theory of cold which has been advanced with the confidence of demonstration. "Heat is a stimulus; cold is the abstraction of heat; therefore cold is the abstraction of stimulus, or is a sedative." To this we might oppose another theory, equally syllogistic, and nearer the truth: Free caloric is a stimulus; cold is the sensation excited by the passage of free caloric out of the body; therefore cold is a stimulus. But in fact the action of cold is by no means so simple. It is complicated, and varies according to its intensity, duration, and the state of the system to which it is applied.

It acts at first as a stimulant, in exciting sensation ; then as a tonic, in condensing the living fibre ; and lastly, however paradoxical it may appear, as a sedative, by preventing that distribution of blood in the minute and ultimate vessels, which is necessary for the existence of sensibility and irritability, and by the abstraction of the stimulus of heat.

The cold bath may be therefore so managed as to procure any of these effects by regulating the length of time for which it is applied.

Cold affusion, or the pouring of cold water over the body, is a very convenient way of applying the cold bath in many cases. In this way cold is very suddenly applied to the surface, its operation is instantaneous and momentary, but may be continued by repeated affusions for any length of time, and so as to produce its extreme effects. Where the effects of cold affusion may be thought too severe, sponging the body with cold water, or water and vinegar may be substituted.

The application of cold may be employed in fevers and febrile paroxysms, when the heat is steadily above the natural standard, and in many diseases arising from relaxation and debility. It is contraindicated when the heat of the body is below 97° , when there is any notable perspiration from the surface, and when there is general plethora. Irritable habits should be defended from the violence of its action, by covering the body with flannel.

In yellow fever, especially in those cases in which the heat of the skin is excessive, it is particularly useful, and ought to be long continued. In phrenitis, and other local inflammations, it promises to be of advantage. In gout its effects are doubtful, being in some instances salutary, in others destructive. A criterion, to enable us to determine when it ought or ought not to be resorted to, is much wanted. In inflammatory rheumatism and rheumatic gout it is decidedly useful. It is of advantage in all the hæmorrhagies and exanthemata ; in tetanus, colic, cholera, hysteria, mania, ischuria, and in burns ; and in general in all those local diseases in which solutions of acetate of lead, of muriate of ammonia, &c. are usually employed ; for the good effects of these depend almost entirely on their diminished temperature.

Pharm. prep.—Aqua distillata, *Ed. Lond. Dub.* It also enters into the composition of the greatest number of preparations.

ARBUTUS UVA URSI. *Ed. Uva Ursi. Lond. Dub.*

Whortleberry.

Off.—Folium. The leaves.

Willd. g. 871, *sp.* 7.—*Decandria Monogynia.*—*Nat. ord.* Bicornes.

THIS is a very small evergreen shrub. The leaves are oval, not toothed, and their under surface is smooth and pale green. They grow wild in the woods, and on sand hills in Scotland, and in almost every country in Europe. The *green* leaves alone, Dr. Bourne says, should be selected and picked from the twigs, and dried by a moderate exposure to heat. The powder, when properly prepared, is of a light brown colour, with a shade of greenish yellow, has nearly the smell of good grass hay, as cut from the rick, and to the taste is at first smartly astringent and bitterish, which sensations gradually soften into a liquorice flavour. Digested in alcohol they give out a green tincture, which is rendered turbid by water, and when filtered, passes transparent and yellow, while a green resin remains on the filter. They are powerfully astringent, approaching, in the deepness of the colour which they give to red sulphate of iron, more nearly to nut-galls than any substance I have tried. Indeed in some parts of Russia they are used for tanning.

Medical use.—The medical effects of this medicine depend entirely on its astringent and tonic powers. It is therefore used in various fluxes arising from debility, menorrhagia, fluor albus, cystirrhœa, diabetes, enuresis, diarrhœa, dysentery, &c. It has been strongly recommended in phthical complaints by Dr. Bourne, and in diseases of the urinary organs by De Haen, particularly in ulcerations of the kidneys and bladder. It certainly alleviates the dyspeptic symptoms accompanying nephritic complaints. It is commonly given in the form of powder, in doses of from 20 to 60 grains three or four times a-day.

ARCTIUM LAPPA. *Ed. Bardana. Lond. Dub.*

Burdock.

Off.—Radix. The root.

Willd. g. 1429, sp. 1. Syngenesia Polygamia Æqualis.—Nat. ord.

Compositæ Capitata.

This is a perennial plant, which grows wild in uncultivated places. The seeds have a bitterish subacid taste: they are recommended as very efficacious diuretics, given either in the form of emulsion, or in powder, to the quantity of a drachm. The roots taste sweetish, with a light austerity and bitterishness: they are esteemed aperient, diuretic, and sudorific, and are said to act without irritation, so as to be safely ventured upon in acute disorders. Decoctions of them have of late been used in rheumatic, gouty, venereal, and other disorders; and are preferred by some to those of sarsaparilla.

ARGENTUM *Ed. Lond. Argentum in laminas extensum. Dub.*

Silver. Silver leaf.

THE chemical and physical properties of silver have been already enumerated.

Silver is found,

I. In its metallic state :

1. Pure.
2. Alloyed with gold. Auriferous silver ore,
3. ————— antimony.
4. ————— iron and arsenic.
5. ————— bismuth.

II. Combined with sulphur :

1. Sulphuretted silver. Vitreous silver ore.
2. ————— with antimony, iron, arsenic, and copper. Black or brittle silver ore.
3. ————— with copper and antimony. Black silver ore.
4. Sulphuretted silver with lead and antimony. White silver ore.

III. Oxidized :

1. Combined with carbonic acid and antimony.
2. ————— muriatic acid.
 - a. Corneous silver ore.
 - b. Earthy silver ore.
 - c. Sooty silver ore.
3. Combined with sulphur and oxide of antimony. Red silver ore.
4. ————— molybdic acid.

Off. prep.—Nitras argenti, *Ed. Lond. Dub.*

ARISTOLOCHIA SERPENTARIA. *Ed. Serpentaria Virginiana. Lond. Dub.*

Virginian Snake-root.

Officinal—Radix. The root.

Gynandria Hexandria.—Nat. ord. *Sarmentosa*.

THIS is a small, light, bushy root, consisting of a number of strings or fibres matted together, issuing from one common head; of a brownish colour on the outside, and paler or yellowish within. It has an aromatic smell, like that of valerian, but more agreeable: and a warm, bitterish, pungent taste, very much resembling that of camphor. I find that, treated with alcohol, it affords a bright green tincture, which is rendered turbid by water; by filtration a small portion of a green matter is separated,

but its transparency is not restored. It neither precipitates tannin or gelatin, nor affects the salts of iron or tincture of turnsole. When the diluted tincture is distilled, the spirit and tincture pass over milky, strongly impregnated with its peculiar flavour.

Medical use.—Its virtues are principally owing to the essential oil with which it abounds. Its general action is heating and stimulant; its particular effects, to promote the discharge by the skin and urine. In its effects it therefore coincides with camphor, but seems to be a more permanent stimulus.

It is recommended,

1. In intermittent fevers, especially when the paroxysms do not terminate by sweating, and to assist the action of Peruvian bark in obstinate cases.
2. In typhus, and in putrid diseases, to support the *vis vitæ*, and to excite gentle diaphoresis.
3. In exanthematous diseases, when the fever is of the typhoid type, to support the action of the skin, and keep out the eruption.
4. In gangrene. Externally it is used as a gargle in the putrid sore throat.

It is exhibited,

1. In powder, which is the best form, in doses of twenty or thirty grains.
2. In infusion with wine or water. By decoction its powers are entirely destroyed.

It is often combined with Peruvian bark, or with camphor.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. cinchon. comp. *Lond. Dub.* Elect. opiat. *Ed.* Cataplasma cumini, *Lond.*

ARNICA MONTANA. *Ed. Dub. Lond.*

German Leopards-bane.

Off.—Flos, herba, radix. The flower, herb, and root.

Willd. g. 491. *sp. 1.* *Syngenesia Polygamia superflua.*—*Nat. ord. Compositæ radiatæ.*

LEOPARDS-BANE is a very common perennial plant in the alpine parts of Germany, in Sweden, Lapland, and Switzerland. The flowers, which are of a yellow colour, and compound, consisting entirely of tubular florets, are distinguished from similar flowers, with which they are often mixed, from ignorance or fraud, by the common calyx, which is shorter than the florets, and consists

entirely of lancet-shaped scales, lying parallel, and close to each other, of a green colour, with purple points. The calyx of the different species of *Inula* are composed of bristle-shaped scales, reflected at the points, and beset with hairs. The florets of the genus *Hypochæris* are strap-shaped.

These flowers have a weak bitterish taste, evidently combined with a degree of acrimony; and when rubbed with the fingers, have a somewhat aromatic smell. Their active constituents are not sufficiently ascertained. They evidently contain a great deal of resin, and some essential oil.

Medical use.—In their effects they are stimulating, and supposed to be discutient. In small doses, and properly administered, they possess very beneficial effects, in raising the pulse, in exciting the action of the whole sanguiferous system, in checking diarrhoeas, in promoting expectoration, and, most particularly, in removing paralytic affections of the voluntary muscles; but their use is frequently attended with no sensible operation, except that in some cases of paralysis, the cure is said to be preceded by a peculiar prickling, and by shooting pains in the affected parts. When given improperly, or in too large doses, they excite an insupportable degree of anxiety, shooting and burning pains, and even dangerous hæmorrhagies, vomiting, vertigo, and coma. For these dangerous symptoms, vinegar is said to be the best remedy.

They have been recommended,

1. In paralytic disorders, in chronic rheumatism, in retention of the urine, from paralysis of the bladder, in amaurosis.
2. In intermittent fevers, combined with Peruvian bark.
3. In dysentery and diarrhoea, but in some cases they have had bad effects
4. In putrid diseases.
5. In typhoid inflammations.
6. To promote the uterine discharge.
7. And in internal pains, and congestions, from bruises. In the countries where they are indigenous, the flowers of the leopards-bane have long been a popular remedy in these accidents.

They are contraindicated by an inflammatory diathesis, a predisposition to hæmorrhagies, and internal congestions.

They are best exhibited in the form of infusion. One or two scruples may be infused with half a pound of water, and drunk at proper intervals. The flowers should be wrapt up in a piece of linen, as otherwise their down is apt to be diffused in the liquid, and to cause violent irritation of the throat.

Root.—The dried root of this plant is about the thickness of a small quill, and sends out fibres along on one side. Externally it is rough, and of a red brown colour, internally of a dirty white. Its taste is acrid, and slightly bitter. Neumann extracted from 960 parts 840 watery extract, and 5 alcoholic; and inversely 270 alcoholic, and 540 watery.

Medical use.—It is exhibited in the same manner and circumstances as the flowers, but it is more apt to excite vomiting. In powder its dose is from five to ten grains.

ARSENICUM.

Arsenic.

THE general properties of this metal have been already enumerated.

Arsenic is found,

I In its metallic state:

1. Alloyed with iron. Native arsenic.
2. ————— iron and gold.
3. ————— cobalt.
4. Combined with iron and sulphur. Arsenical pyrites.
5. ————— iron, sulphur, and silver. White arsenical pyrites.

II. Oxidized:

1. Uncombined. White oxide of arsenic. Arsenious acid.
2. Combined with sulphur:
 - a. Oxide of arsenic 90, sulphur 10, Orpiment. Yellow sulphuretted arsenic.
 - b. Oxide of arsenic 84, sulphur 16, Realgar. Red sulphuretted arsenic.

III. Acidified and combined:

1. With lime.
2. With copper.
3. With iron.
4. With lead.
5. With nickel.
6. With cobalt.

OXIDUM ARSENICI. *Ed.*

Oxide of arsenic. (Arsenious acid, Fourcroy.)

THIS substance, which was formerly named, improperly, arsenic, is most generally obtained in the process of roasting the ores

of cobalt in Saxony. The roasting is performed in a kind of reverberatory furnace, with which a very long chimney is connected, lying in a horizontal direction. The arsenious acid is condensed in it in the form of a loose grey powder, which, by a second sublimation with a little potash, and in a great degree of heat, coalesces into a firm vitreous sublimate, which gradually becomes opaque by exposure to the air. In this state it is the white arsenic of commerce, or, as it should be termed, the arsenious acid. For internal use, the lumps of a shining appearance and dazzling whiteness should be chosen; but it is generally offered to sale in the form of powder, which is very often mixed with chalk or gypsum. The fraud is easily detected by exposing it to heat. The arsenious acid is entirely sublimed, and the additions remain behind.

As this substance is one of the most virulent poisons, we shall give a full account of its properties. It is white, compact, brittle, and of a glassy appearance. Its taste is sweetish, but acrid, and slow in manifesting itself. It sublimes entirely when exposed to 283° Fahrenheit. When the operation is performed in close vessels, the arsenious acid assumes a glassy appearance, which it soon loses on exposure to the air. In open vessels it sublimes in dense white fumes, smelling strongly of garlic. If a plate of copper be exposed to the fumes, it is whitened. Arsenious acid is soluble in 80 parts of water at 60° , and in 15 at 212° . This solution has an acrid taste, and reddens vegetable blues. It is also soluble in 80 parts of boiling alcohol. From either solution it may be obtained regularly crystallized in tetrahedrons. From its solutions a grass-green precipitate is separated by a solution of sulphate of iron, a white precipitate by lime-water, and a yellow precipitate by any of the combinations of an alkali with sulphur, or with sulphur and hydrogen. All these precipitates, when exposed to a sufficient temperature, sublime entirely, and emit the smell of garlic. When treated with nitric acid, the arsenious acid is converted into arsenic acid. But by far the surest test of the presence of arsenic, is its reduction by carbonaceous substances. With this view, a small quantity of any suspected substance may be mixed with some fatty or oily matter, and introduced within a tube closed at the bottom, and exposed to a red heat; if arsenic be present in any state, it will be sublimed in the form of brilliant metallic scales.

Arsenious acid is used by the dyers, as a flux in glass-making, in docimastic works, and in some glazes. Arsenious sulphurets are much used by painters, but these advantages are not able to compensate for its bad effects. In mines, it causes the destruction of numbers who explore them; being very volatile, it forms a dust, which affects and destroys the lungs, and the unhappy

miners, after a languishing life of a few years, all perish sooner or latter. The property which it possesses of being soluble in water, increases and facilitates its destructive power; and it ought to be proscribed in commerce, by the strict law which prohibits the sale of poisons to unknown persons. Arsenious acid is every day the instrument by which victims are sacrificed, either by the hand of wickedness or imprudence. It is often mistaken for sugar, and these mistakes are attended with the most dreadful consequences. The symptoms which characterize this poison are, a great constriction of the throat, the teeth set on edge, and the mouth strongly heated, an involuntary spitting, with extreme pains in the stomach, vomiting of glairy and bloody matter, with cold sweats and convulsions.

On dissection, the stomach and bowels are found to be inflamed, gangrenous, and corroded, and the blood is fluid. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, the epidermis separates, and the whole body becomes very speedily putrid. When the quantity is so very small as not to prove fatal, tremors, palsies, and lingering hectic succeed.

Mucilaginous drinks have been long ago given to persons poisoned by arsenic. Milk, fat, oils, and butter, have been successively employed. M. Navier has proposed a more direct counterpoison. He prescribes one drachm of sulphuret of potash to be dissolved in a pint of water, which the patient is directed to drink at several draughts; the sulphur unites to the arsenic, and destroys its causticity and effects. When the first symptoms are alleviated, he advises the use of sulphureous mineral waters. He likewise approves the use of milk, but condemns oils. Vinegar, which dissolves arsenic, has been recommended by M. Sage, but upon what grounds we know not.

According to Hahneman, a solution of soap is the best remedy. One pound of soap may be dissolved in four pounds of water, and a cupful of this solution may be drunk lukewarm every three or four minutes.

Medical use.—Notwithstanding, however, the very violent effects of arsenious acid, it has been employed in the cure of diseases, both as applied externally, and as taken internally.

Externally it has been chiefly employed in cases of cancer.

Justamond used an ointment composed of four grains of white oxide of arsenic, ten grains of opium, and a drachm of cerate, and spread very thin upon linen. But its action is tedious. He also fumigated cancerous sores with sulphuret of arsenic, with a view to destroy their intolerable fetor, with great success. Le Febure washed cancerous sores frequently, in the course of the day, with

a solution of four grains of arsenious acid in two pounds of water. Arneman recommends an ointment of one drachm of arsenious acid, the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of ointment of white oxide of lead, in cancerous, and obstinate ill-conditioned sores, and in suppurated scrofulous glands. The arsenious acid has even been applied in substance, sprinkled upon the ulcer. But this mode of using it is excessively painful, and extremely dangerous. There have been even fatal effects produced from its absorption.

The principal thing to be attended to in arsenical applications is to diminish their activity to a certain degree. They then cause little irritation or pain, but rather excite a gentle degree of inflammation, which causes the diseased parts to be thrown off, as if they were foreign substance, while they have the peculiar advantage of not extending their operation laterally.

No other escharotic possesses equal powers in cancerous affections; but, unfortunately, its good effects often do not go beyond a certain length, and if in some cases it effects a cure, in others it must be allowed it does harm. While it has occasioned very considerable pain, it has given the parts no disposition to heal, the progress of the ulceration becoming even more rapid than before.

Internally it may be exhibited in the form,

1. Of arsenious acid dissolved in distilled water, in the proportion of four grains to a pint. A table spoonful of this solution, mixed with an equal quantity of milk and a little syrup of poppies, is directed to be taken every morning fasting, and the frequency of the dose gradually increased until six table spoonfuls be taken daily. M. Le Febure's method of curing cancer.
2. Of arsenite of potash. Sixty-four grains of arsenious acid, with an equal quantity of carbonate of potash are to be boiled together until the arsenious acid be dissolved, when as much water is to be added as will increase the solution to one pound. Of this, from two to twelve drops may be given once, twice, or oftener, in the course of a day. Dr. Fowler's method of curing intermittent fever.
3. Of arseniate of potash. Mix well together equal quantities of nitrate of potash, and of pure arsenious acid. put them into a retort, and distil at first with a gentle heat, but afterwards with so strong a heat as to redden the bottom of the retort. In this process the nitric

acid is partly decomposed, and passes over into the receiver in the state of nitrous acid. The arsenious acid is at the same time converted into arsenic acid, and combines with the potash. The product, which is arseniate of potash, is found in the bottom of the retort, and may be obtained in the form of crystals, of a prismatic figure, by dissolving it in distilled water, filtering the solution through paper, evaporating and crystallizing. A preparation of M. Maquer's.

4. Arsenious acid, in substance, to the extent of an eighth of a grain for a dose, combined with a little sublimed sulphur, has been said to be exhibited in some very obstinate cases of cutaneous diseases, and with the best effect.

Notwithstanding the successful exhibition of arsenic by Dr. Fowler and other eminent practitioners, and notwithstanding its daily use as a domestic remedy in the fenny parts of England and other countries, for the cure of intermittent fevers, it is suspected on such strong grounds of undermining the constitution, and laying the foundation for mortal diseases, that its general use ought to be discouraged. The French directory were, however, of a different opinion, when they published an edict ordering the surgeons of the Italian army to free the numberless soldiers who were seized with agues in the marshes of Lombardy, of their complaints, in the course of two or three days, and at the expense of as many souls, under the pains of military punishment.

ARTEMISIA.—*Will. g. 1473. Syngenesia Polygamia superflua.*
—*Nat. ord. Compositæ discoideæ.*

Sp. 8. ARTEMISIA ABROTANUM. Abrotanum. Lond.
Southernwood.

Off.—*Folium.* The leaves.

This is a perennial shrub, which grows readily in our gardens, though a native of the south of Europe.

Southernwood has a strong smell, which, to most people, is not disagreeable; it has a pungent, bitter, and somewhat nauseous taste. These qualities are very completely extracted by alcohol, and the tincture is of a beautiful green colour. They are less perfectly extracted by watery liquors, the infusion being of a light brown colour.

Med. use.—Southernwood, as well as some other species of the same genus, has been recommended as an anthelmintic; and it has also been sometimes used as stimulant, detergent, and sudorific. Externally, it has been employed in discutient and antiseptic.

tic fomentations; and under the form of lotion and ointment for cutaneous eruptions, and for preventing the hair from falling off. But it is at present very rarely used in any way.

Off. prep.—Decoct. pro foment. *Lond.*

Sp. 42. ARTEMISIA MARITIMA. *Absinthium Maritimum.* *Lond. Dub.*

Sea Wormwood.

Off.—Cacumina. The tops.

THIS species of artemisia is perennial and herbaceous. It grows wild in salt marshes, and in several parts about the sea-coasts. In taste and smell it is weaker and less unpleasant than the common wormwood, and is now almost rejected from practice.

Off. prep.—Decoct. pro foment. *Lond.* Conserv. *Lond.*

Sp. 26. ARTEMISIA SANTONICA. *Ed.* *Santonicum.* *Lond. Dub.*
Wormseed.

Off.—Cacumen, semen. The tops, the seeds.

ALL the British colleges have given this species as the plant which produces these seeds, but the fact is by no means ascertained. They have been ascribed by different writers to other species of the same genus, the Judaica, the Contra, and the Austriaca, and are even said by Saunders to be the produce of a species of Chenopodium.

The seeds themselves are small, oblong, smooth, and of a greenish or greyish yellow colour. As the whole head is gathered after the seeds are ripe, they are mixed with the scales of the calices and bits of stalks. Their taste is bitter, and somewhat acrid, their smell strong and disagreeable. Those which come from Aleppo are esteemed the best, and those from Barbary the worst. When they have no smell, and a less intensely bitter taste, and are discoloured, and mixed with a longer kind of seed, they are to be rejected. They are also adulterated with the seeds of tansy and wormwood. The latter are easily known, by having a light yellow colour, and resembling powdered hay more than seeds. Neumann obtained from 480 parts 213 of alcoholic extract, and 110 watery; and inversely, 260 watery, and 28 alcoholic. It gave a slight flavour to water distilled from it, but no oil.

Med. use.—Wormseed is one of the oldest and most common anthelmintics, especially in the lumbrici of children. On account of their essential oil, they are heating and stimulating.

They are given to children,

1. In substance, to the extent of ten grains, or half a drachm, finely powdered, and strewed on bread and butter; or

made into an electuary with honey or treacle; or candied with sugar; or diffused through milk, and taken in the morning when the stomach is empty.

2. In infusion or decoction, but to these forms their bitterness is a strong objection.

After they have been used for some days, it is customary to give a cathartic, or they are combined from the beginning with rhubarb, jalap, calomel, sulphate of iron, or muriate of ammonia.

Sp. 63. ARTEMISIA ABSINTHIUM. Ed. Absinthium vulgare. Lond. Dub.

Common wormwood.

Off.—Folium, summitas florens. The herb, leaves, and flowering heads.

THIS perennial herb grows by the road sides, and on rubbish, in many parts of Britain; and about London it is cultivated for medical use. Its smell is strong and disagreeable; its taste intensely bitter. Its active constituents are bitter extractive and essential oil. It is used in stomach complaints, and is of great service to hypochondrists. It is also employed in intermittent fevers, in cachectic and hydropic affections, in jaundice, and against worms. Many persons cannot suffer the disagreeable smell of wormwood, which is apt to occasion headach, but it may be freed from it in a great measure by decoction. The extract is a pure and simple bitter. The essential oil is of a dark green colour, and contains the whole flavour of the plant. It is stimulating, and is supposed to be a powerful antispasmodic and anthelmintic. It was formerly much used for the preparation of medicated wine and ales.

ARUM MACULATUM. Arum. Lond. Dub.

Wake-robin.

Off.—Radix recens. The recent root.

Gynandria Polyandria.—Nat. ord. *Piperita.*

THIS is a perennial solid bulbous-rooted plant, which grows wild in shady situations, and by the sides of banks, in many parts of Britain. The root is knotty, roundish, and white. When collected in spring, before the leaves shoot, or in autumn, after flowering, it contains a milky juice, of very great acrimony. Applied to the tongue, it causes a burning heat, which lasts for many hours, and excites considerable thirst. These disagreeable symptoms may be relieved by butter-milk or oily fluids. Rubbed between the fingers, it blisters and excoriates them; it is there-

fore a corrosive vegetable poison. By drying, it loses the greatest part of its acrimony, and becomes simply amylaceous. It is also rendered perfectly mild by frequent washing with water. Its acrimony is therefore easily destructible; and as it does not arise from the presence of an essential oil, it depends upon a vegetable principle, different from all others, and not well understood. It does not rise in distillation, either with alcohol or with water, and is not contained in its extract, although the root is thereby deprived of it. Neumann obtained from 480 of the dry root 20 of alcoholic extract, and about 180 watery. The former had some slight pungency, the latter none.

Medical use.—In the recent root, the degree of acrimony is so very uncertain, and often so excessive, that its effects, as an internal remedy, cannot be depended on. The dried root is perfectly inert; but the roots may be kept fresh for a year, by burying them in a cellar in sand.

Off. prep.—*Conserv. Lond.*

ASARUM EUROPÆUM. *Ed. Asarum. Dub. Lond.*

Afarabacca.

Off.—Folium. The leaves.

Willd. g. 925. sp. 1. Dodecandria Monogynia.—*Nat. ord. Sarmenlacea.*

THIS is a perennial plant, which is a native of some places of England, although the dried roots are generally brought from the Levant. It grows in moist and shady situations. It produces only two leaves, which are uniform and very obtuse. The root is fibrous, of a grey-brown colour externally, but white within. Both the roots and leaves have a nauseous, bitter, acrimonious, hot taste; their smell is strong, and not very disagreeable.

In its analysis, it is said by Neumann to agree with ipecacuanha, but it seems to contain, besides its odorous principle, which is probably camphor, a portion of the same acrid principle which has been noticed when speaking of arum. Upon this its virtues depend; and as this principle is volatile, we find accordingly that asarabacca loses much of its activity by decoction and long keeping.

Given in substance from half a drachm to a drachm, it evacuates powerfully both upwards and downwards. It is said, that tinctures made in spiritous menstrua, possess both the emetic and cathartic virtues of the plant: that the extract obtained by inspissating these tinctures acts only by vomiting, and with great mildness: that an infusion in water proves cathartic, rarely emetic: that aqueous decoctions made by long boiling, and the wa-

tery extract, have no purgative or emetic quality, but prove good diaphoretics, diuretics, and emmenagogues.

The principal use of this plant among us is a sternutatory. The root of asarum is perhaps the strongest of all the vegetable errhines, white hellebore itself not excepted. Snuffed up the nose, in the quantity of a grain or two, it occasions a large evacuation of mucus, and raises a plentiful spitting. The leaves are considerably milder, and may be used to the quantity of three, four, or five grains. Geoffroy relates, that after snuffing up a dose of this errhine at night, he has frequently observed the discharge from the nose to continue for three days together; and that he has known a paralysis of the mouth and tongue cured by one dose. He recommends this medicine in stubborn disorders of the head, proceeding from viscid tenacious matter, in palsies, and in soporific distempers.

Off. prep.—Pulv. comp. *Ed. Lond. Dub.*

ASTRAGALUS TRAGACANTHA. *Ed. Tragacantha. Lond. Dub.*

Tragacanth.

Off.—Gummi. Gum Tragacanth.

Willd. g. 1379. *sp. Diadelphia Decandria.*—*Nat. ord. Papilionaceæ.*

GUM TRAGACANTH is the produce of a very thorny shrub, which grows on the island of Candia, and other places in the Levant.

About the end of June a fluid exudes from the stem and larger branches, which dries in the sun, and is collected by the shepherds on Mount Ida, from whence it is sent to Europe, under the title of Tragacanth.

It consists of whitish semi-transparent vermiform pieces, scarcely a line in thickness, without taste or smell.

There is also a dirty yellow, or brownish kind, which is not fit for medical purposes.

Tragacanth is difficultly pulverizable, unless when thoroughly dried, and the mortar heated, or in frost. According to Neumann, it gives nothing over in distillation, either to water or alcohol: alcohol dissolves only about 10 parts of 480, and water the whole. Lewis, however, more accurately observes, that it cannot be properly said to be dissolved; for, put into water, it absorbs a large proportion of that fluid, increasing immensely in volume, and forming with it a soft, but not fluid, mucilage; and although it is easily diffused through a larger proportion of water, after standing a day or two, the mucilage subsides again, the supernatant fluid retaining little of the gum.

Besides these remarkable differences from gum-arabic in regard to brittleness, insolubility, and the quantity of water which it thickens, I find that tragacanth is not precipitated by silicized potass, and is precipitated by sulphate of copper and acetate of lead.

In pharmacy it is employed for forming powders into troches, and rendering tough cohesive substances, such as colocynth, pulverizable, by beating them with mucilage of tragacanth, and then drying the mass. For electuaries it is improper, as it renders them slimy on keeping.

Off. prep.—Pulv. comp. *Lond.* Pulv. cerussæ comp. *Lond.* Mucilago, *Ed. Lond. Dub.* Trochisci glycyrr. *Lond. Dub.* Trochisci nitri, *Lond.*

ATROPA BELLADONNA. *Ed. Belladonna. Dub. Solanum lethale.*

Deadly nightshade.

Willd. g. 381. sp. 2. Pentandria Monogynia.—*Nat. ord. Solanaceæ.*

Off.—Folium. The leaf.

THE deadly nightshade is a perennial plant, with a herbaceous stem, which is indigenous both in mountainous and wood situations in this country, and often cultivated in gardens. The whole plant is poisonous, and the berries, from their beautiful appearance, have sometimes proved fatal to children. The symptoms excited are, a dryness of the mouth, a trembling of the tongue, a very distressing thirst, a difficulty of swallowing, fruitless efforts to vomit, and great anxiety about the præcordia. Delirium then comes on, with gnashing of the teeth, and convulsions. The pupil remains dilated, and is not sensible even to the stimulus of light. The face becomes tumid, and of a dark red colour. The jaws are frequently locked. Inflammation attacks the œsophagus, stomach, and intestines, sometimes extending to the mesentery, lungs, and liver, accompanied with violent pains in the abdomen. The stomach is very insensible to stimulus, and the peristaltic motion of the intestines is destroyed. General relaxation, palsy, especially of the lower extremities, convulsions, vertigo, blindness, coma, and death succeed. The body soon putrifies, swells, and becomes marked with livid spots; blood flows from the nose, mouth, and ears, and the stench insufferable. On dissection the blood is found to be fluid, the intestines are inflated and inflamed, or eroded and gangrenous. The best method of cure is to excite vomiting as soon as possible by emetics, and tickling the fauces; to evacuate the bowels by purgatives and glysters; and to give, largely, vinegar, honey

milk, and oil. In some children who recovered by this treatment, the delirium was succeeded by a profound sopor, accompanied with subfultus tendinum; the face and hands became pale and cold, and the pulse small, hard, and quick. Their recovery was slow, and the blindness continued a considerable time, but at last went off.

By distillation in the vapour bath, Geoffroy procured from the recent leaves a slightly acrid liquor, and the residuum by destructive distillation yielded carbonate of ammonia.

Medical use.—Yet this virulent poison, under proper management, may become an excellent remedy. Besides its narcotic power, it promotes all the excretions; but its exhibition requires the greatest caution; for it is apt, when continued for any length of time, even in small doses, to cause dryness and tension of the throat and neighbouring parts, vertigo, dimness of sight, and even temporary blindness. When any of these symptoms occur, its use must be suspended for some time, and afterwards resumed in smaller doses.

Deadly nightshade has been exhibited,

1. In several febrile diseases; in obstinate intermittents; and in the plague.
2. In inflammations; the gout.
3. In comatose diseases; in palsy, and loss of speech from apoplexy.
4. In spasmodic diseases; in chorea, epilepsy, chincough, hydrophobia, melancholy, and mania.
5. In cachectic affections; in dropsies, and obstinate jaundice.
6. In local diseases; in amaurosis, ophthalmia, in schirrhus, and cancer.

Deadly nightshade is best exhibited in substance, beginning with a very small dose of the powdered leaves or root, such as the fourth or eighth part of a grain for children, and one grain for adults, to be repeated daily, and gradually increased. In hydrophobia, Münch gave the powdered root every second morning, to the extent of from one to five grains to children, and fourteen or fifteen grains to adults.

The watery infusion is also a powerful remedy. One scruple of the dried leaves are infused in ten ounces of warm water, and strained after cooling. At first two ounces of this may be given daily to adults, and gradually increased, until the tension of the throat shews that it would be imprudent to go farther.

The watery extract is not a judicious preparation.

Externally, the powdered leaves are applied as a narcotic to diminish pain, and to cancerous and ill-conditioned sores. From its effect, in permanently dilating the pupil, Professor Reimarus proposed, and tried with success, the dropping a little of the infusion into the eye, a few hours before performing the operation for the cataract, with the view of facilitating the operation.

Off. prep.—Succ. spiss. atrop. bell. *Ed.*

AVENA SATIVA. *Ed. Avena. Lond.*

Willd. g. 142. sp. 13. Triandria Digynia.—Nat. ord. *Gramina.*

Oats.

Off.—Semen. The seed.

THIS is a well known annual plant, which is very generally cultivated in northern countries, and in many places furnishes their principal subsistence. When simply freed from the husks, this grain gets the name of groats, but it is more frequently ground into meal. Groats are made into broths. Oat-meal is baked with salt and water into cakes, or with the same additions, is boiled to form porridge. An infusion of the husks in water, allowed to remain till it become acidulous, is boiled down to a jelly, which is called sowins. In all these forms it is nutritious, and easy of digestion.

Med. use.—Gruels or decoctions, either of groats or oat-meal, either plain or acidified, or sweetened, form an excellent drink in febrile diseases, diarrhoea, dysentery, &c. and from their demulcent properties, prove useful in inflammatory disorders, coughs, hoarseness, roughness, and exulcerations of the fauces. Porridge is also frequently applied to phlegmenous swellings, to promote their suppuration.

BERBERIS VULGARIS. *Berberis. Dub.*

Barberry.

Off.—Fructus. The fruit.

Willd. g. 677. sp. 1. Hexandria Monogynia.—Nat. ord. *Tribilata.*

THE barberry is a small tree, or rather a large bush, covered with an ash-coloured bark, under which is contained another of a deep yellow: the berries are of an elegant red colour, and contain each two hard brown seeds. It grows wild on chalky hills in several parts of England; and is frequently planted in hedges and in gardens.

The outward bark of the branches and the leaves have an astringent acid taste: the inner yellow bark a bitter one. This last is said to be serviceable in the jaundice; and by some to be an useful purgative.

The berries contain a very acid red juice, which consists chiefly of malic acid. This juice forms a useful and pleasant addition to antiphlogistic drinks, in fluxes, and malignant fevers, for abating heat, quenching thirst, raising the strength, and preventing putrefaction. They also form a very elegant syrup or preserve, which may be employed with advantage in the same diseases.

BETULA ALBA. *Dub.*

The birch tree.

Off.—Succus. The juice.

Monœcia Tetandria.—Nat. ord. *Amentaceæ*.

This tree grows wild in most woods: its bark is astringent.

Upon deeply wounding or boring the trunk of the tree in the beginning of spring, a sweetish juice issues forth, sometimes, it is said, in so large a quantity as to equal in weight the whole tree and root: one branch will bleed a gallon or more in a day. This juice is chiefly recommended in scorbutic and similar disorders: its most sensible effect is to promote the urinary discharge.

BITUMEN PETROLEUM. *Ed. Petroleum. Lond. Petroleum Barbadosense. Resina. Dub.*

Rock oil. Barbadoes tar.

BITUMEN is now employed as the generic name for several inflammable bodies of different degrees of consistency, from perfect fluidity to that of a brittle but very fusible solid, and of little specific gravity. They are insoluble in alcohol or in water, combine with essential oils and sulphur, decompose only a small proportion of nitrate of potash by deflagration, and on inflammation leave little or no residuum.

Sp. 1. NAPHTHA. It is nearly as colourless, transparent, and fluid as water. Specific gravity 0.729 to 0.847, of a highly penetrating, yet not disagreeable smell, somewhat like that of rectified oil of amber, very volatile, and remaining fluid at 0° Fahrenheit.

Sp. 2. PETROLEUM. Not so fluid, transparent, or colourless, as the former; smell less pleasant. Specific gravity 0.878.

Sp. 3. MINERAL TAR. Viscid; of a dark colour; smell sometimes strong, but often faint. Specific gravity 1.1.

Sp. 4. MINERAL PITCH.—Maltha. Brittle in cold weather; of a dark colour; opaque. Specific gravity probably 1.07.

Sp. 5. ASPHALTUM. Very brittle; fracture conchoidal; glassy lustre; no smell, unless when melted or heated. Specific gravity 1.07 to 1.65. Fusible and inflammable.

According to Mr. Kirwan and Mr. Hatchett, the first species, by exposure to the air, and gradual decomposition, passes success-

ively through the intermediate states, till at last it is converted into asphaltum. When partially decomposed, the remaining naphtha may be separated by distillation from the superabundant charcoal.

From the different pharmacopœias having been published before the specific characters were properly ascertained, there is some confusion with regard to the species which is officinal. The London college name the second, and the Dublin college the third; but the latter err greatly in calling it a resin; while the Edinburgh college incorrectly give petroleum Barbadosense, which belongs to the third species, as a synonyme of bitumen petroleum, which is the second. The first species is found abundantly in Persia; but what we receive comes from the duchy of Modena in Italy. It is very rarely met with in the shops; the second, mixed with a little of the third, and some subtiler oil, is usually sent us instead of it.

Medical use.—Petroleum is at present very rarely employed as a medicine; though, if the finer kinds could be procured genuine, they seem to deserve some notice. They are more agreeable than the oil of amber, and milder than that of turpentine, of the virtues of both of which they participate. They are principally recommended by authors for external purposes, against pains and aches, in paralytic complaints, and for preventing chilblains. For these intentions, some of the more common mineral oils have been made use of with good success. An oil extracted from a kind of stone coal has been extolled among the common people, under the name of British oil, for rheumatic pains, &c.; even this is often counterfeited by a small portion of oil of amber added to the common expressed oils.

The Barbadoes tar is found in several of the West-India islands, where it is esteemed by the inhabitants of great service as a sudorific, and in disorders of the breast and lungs; though in case of this kind, attended with inflammation, it is certainly improper; they likewise apply it externally as a discutient, and for preventing paralytic disorders.

Off. prep.—Ol. petrolei, *Lond.* Petrol. sulph. *Lond.*

BOLETUS IGNIARIUS. *Ed. Agaricus chirurgorum. Off. Cryptogamia Fungi.*—*Nat. ord. Fungi.*

Female agaric, or agaric of the oak, called, from its being very easily inflammable, Touchwood, or Spunk.

THIS fungus is frequently met with on different kinds of trees in Britain, especially the cherry and plumb; and is said to have been sometimes brought into the shops mixed with the true agaric of the larch; from this it is easily distinguishable, by its greater

weight, dusky colour, and mucilaginous taste void of bitterness. The medullary part of this fungus, beaten soft, and applied externally, has been much celebrated as a styptic; and said to restrain not only venous, but arterial hæmorrhagies, without the use of ligatures. It does not appear, however, to have any real styptic power, or to act any otherwise than dry lint, sponge, or other soft fungous applications. It is best when gathered in August or September.

BOLUS GALLICUS. *Lond.*

French bole.

BOLES are earthy aggregates, consisting chiefly of siliceous and argillaceous earths. They are less coherent and more friable than pure clay, more easily diffused through water, and more freely subsiding from it. They feel greasy to the touch, adhere slightly to the tongue, and break down in the mouth, impressing a light sense of astringency. A great variety of these substances were formerly used in medicine, but the French bole alone is now retained in the London Pharmacopœia. It is of a pale red colour, variegated with irregular specks or veins of white and yellow.

These earths have been recommended as astringent, sudorific, and alexipharmic; and they have been used in diarrhœas, dysenteries, hæmorrhagies, and in malignant and pestilential distempers. In intestinal fluxes, and complaints in the first passages, from thin acrimonious humours, they may doubtless be of some use: but the virtues ascribed to them in the other cases appear to have no foundation.

BRYONIA ALBA. (*B. Dioica*; *Jacquin*, *Withering*.) *Bryonia*, *Radix*. *Dub.*

Bryony; wild vine. The root.

Monœcia Syngenesia.—Nat. ord. *Cucurbitaceæ*.

THIS is an indigenous perennial plant, growing on dry banks, under hedges, and climbing upon the bushes. The roots are large, sometimes as thick as a man's thigh; their smell, when fresh, is strong and disagreeable; the taste nauseously bitter, acrid, and biting; the juice is so sharp as in a little time to excoriate the skin: in drying they lose great part of their acrimony, and almost the whole of their smell.

Neumann obtained by expression from a pound of the fresh root nearly six ounces of juice, retaining a great deal of the nauseous smell and taste of the root, and depositing, on standing, a white powdery amylaceous matter, (*fæcula bryoniæ*) recommended as a milder purgative than the root. 960 parts of the dry root yielded to water 606, and afterwards to alcohol 23. Alcohol, when applied first, extracted 170, and water afterwards 250.

Medical use.—Bryony root is a strong irritating cathartic; and as such has sometimes been successfully exhibited in maniacal cases, in some kinds of dropsies, and in several chronical disorders. An extract prepared by water acts more mildly, and with greater safety, than the root in substance; given from half a drachm to a drachm, it is said to prove a gentle purgative, and likewise to operate powerfully by urine. The fresh root, applied externally, is said to be a powerful discutient in œdematous swellings.

BUBON GALBANUM. *Ed. Syn. Galbanum. Lond. Dub. Willd. g. 546 sp. 2.—Pentandria Digynia—Nat. ord. Umbellata. Off.—Gummi-refina. Galbanum, a gum-resin.*

THIS plant is perennial, and grows in Africa. It abounds with a milky juice, which sometimes exudes from the joints of the old plants, but is more frequently obtained by cutting them across some inches above the root. The juice which flows from the wound soon hardens, and is the galbanum which is brought to us from Syria and the Levant.

The best sort of galbanum consists of pale-coloured pieces, about the size of a hazel nut, which, on being broken, appear to be composed of clear white tears, of a bitterish acrid taste, and a strong peculiar smell. But it most commonly occurs in agglutinated masses, composed of yellowish or reddish and clear white tears, which may be easily torn asunder, of the consistence of firm wax softening by heat, and becoming brittle by cold, and mixed with seeds and leaves. What is mixed with sand, earth, and other impurities, and is of a brown or blackish colour, interspersed with no white grains, of a weak smell, and of a consistence always soft is bad.

Galbanum is almost entirely soluble in water, but the solution is milky; neither do wine nor vinegar dissolve it perfectly. Alcohol according to Hagen, has very little action upon it. It is not fusible: but furnishes a considerable proportion of essential oil when distilled with water. Neumann obtained by distillation with water six drachms of oil, besides what was dissolved in the water. The watery extract amounted to about three ounces. It had somewhat of a nauseous relish, but could not have been recognized as a preparation of galbanum. From the same quantity alcohol extracted upwards of nine ounces and a half of a hard brittle insipid inodorous substance (resin?).

Medical use.—Galbanum agrees in virtue with gum ammoniacum; but is generally accounted less proper in asthmas, and more so in hysterical complaints. It is exhibited in the form of pills c

emulsion, to the extent of about a drachm. Applied externally, it is supposed to resolve and discuss tumours, and to promote sup-
puration.

Off. prep.—Galb. purif. Pil. g. comp. *Lond.* Pil. affæ foet. comp. *Ed.* Tinct. galb. *Lond.* Emplast. picis burgund. *Dub.* E. affæ foetid. *Ed.* E. gummos, *Ed.* E. lith. comp. *Lond.*

CALX. *Lond.* Calx viva. *Ed.* Calx recens usta. *Dub.*

a. Ex lapide calcareo.

b. Ex testis conchyliorum.

Quicklime recently burnt.

LIME is a simple substance, the properties of which have been already enumerated. It is scarcely found in nature uncombined, but is easily prepared from any of its carbonates, either mineral or animal, by the action of fire, which first expels the water, then destroys any animal matters which may be present, and, lastly, expels the carbonic acid. This process is improperly termed the burning of lime. The product is lime, or, as it is commonly called, quicklime.

If about half its weight of water be poured upon lime, a great increase of temperature takes place, steam is produced, and the lime crumbles down into a dry powder, somewhat increased in weight by the presence of part of the water, which has been solidified by the lime: and to the caloric of fluidity, which is expelled during the conversion of the water into a solid, the great increase of the temperature is owing. Lime in this state is said to be slacked. If more water be poured upon slacked lime, there is no new evolution of caloric; but if the water amount to 700 times the weight of the lime, the lime is completely dissolved. This solution is termed Lime-water.

As lime quickly attracts moisture and carbonic acid from the atmosphere, it should be always recently prepared; and when kept, it should be preserved in very close bottles. Lime should not effervesce with acids, and should be entirely soluble in water.

Medical use.—On the living body lime acts as an escharotic, and as such it was formerly applied to ill-conditioned and obstinate sores. Dissolved in water, it is sometimes given internally as a tonic or astringent in scrophula and various fluxes, and formerly it enjoyed considerable reputation as a lithontriptic.

Off. prep.—Aqua calcis, *Ed. Lond. Dub.* Aqua potassæ, *Ed. Lond. Dub.* Aqua ammoniæ, *Ed. Lond. Dub.* Alcohol ammon. *Ed.*

CANCER. *Chelæ. Lond.* Calculi oculi dicti; *Chelæ. Dub.*
The crab. A genus of crustaceous insects,

Sp. CANCER ASTACUS. *Lapilli.* *Ed.*

The craw-fish. Crabs stones, vulgarly called Crabs eyes.

CRABS stones are generally about the size of peas, or larger; somewhat hemispherical in their shapes, and laminated in their texture; of a white colour; but sometimes reddish or bluish.

These concretions are found in the stomach, one on each side, at the time when the crab changes its shell, and also renews the inner membrane of the stomach, which commonly happens in the month of August. They afterwards gradually disappear, and no stones are found after the new shell has acquired its full degree of firmness. They therefore seem to furnish the materials for the induration of the new shell. They are brought in great numbers from Poland and Russia, especially from the province of Astracan, where the craw-fish are either bruised with wooden mallets, or laid up in heaps to putrify, when the flesh is washed away with water, and the stones picked out.

They consist of carbonate of lime, combined with a little phosphate of lime and gelatine. The quantity of the two last is too small, and their action on the living body too inconsiderable to make any considerable difference in medical properties, between these concretions and soft carbonate of lime, as it occurs in the mineral kingdom.

Crab stones are said by most writers on the materia medica to be frequently counterfeited with tobacco-pipe clay, or compositions of chalk with mucilaginous substances. This piece of fraud, if really practised, may be very easily discovered: the counterfeits wanting the leafy texture which is observed upon breaking the genuine; more readily imbibing water; adhering to the tongue and dissolving in vinegar, or the stronger acids, diluted with water, either entirely, or not at all, or by piecemeal; whilst the true crabs stones, digested in these liquors, become soft and transparent, their original form remaining the same, as the organization of the gelatine is not altered by the acid.

Off. prep.—Cancorum lapilli præparati. *Ed.*

Sp. CANCER PAGURUS. *Chela.* *Ed.*

The black-clawed crab. The claws.

THIS species of crab inhabits the sea, and is found especially in the North sea. Its claws are yellow, tipped with black, and in every respect they resemble the former article.

Off. prep.—Cancorum chelæ ppt. *Lond. Dub.* Trochisci cretæ *Lond.* Pulv. chel. canc. comp. *Lond.*

CANELLA ALBA. *Lond. Ed. Dub.*

Willd. g. 942, *sp.* 1. *Dodecandria Monogynia.*—*Nat. ord.* *Olacæ.*

Canella alba.

Off.—Cortex. The bark.

THE canella alba, or, as the Dublin college named it, the *Winterania canella*, is a tall tree, which is very common in Jamaica, and other West-India islands.

The canella is the interior bark, freed from the epidermis, which is thin and rough, and dried in the shade. There are two sorts of canella in the shops, differing from each other in the length and thickness of the quills: they are both the bark of the same tree, the thicker being taken from the trunk, and the thinner from the branches.

It is brought to us rolled up in long quills, thicker than cinnamon, and both outwardly and inwardly of a whitish colour, lightly inclining to yellow. It is a warm pungent aromatic, not of the most agreeable kind; nor are any of the preparations of it very grateful. It must not be confounded with the bark of the *wintera aromatica*.

Medical use.—Canella alba is sometimes employed where a warm stimulant to the stomach is necessary, and is a corrigent of other articles. It is also useful as covering the taste of some other articles.

Off. prep.—Tinct. gent. comp. *Ed.*

CAPSICUM ANNUUM. *Ed.* *Piper Indicum.* *Lond.* *Dub.*

Willd. g. 384, sp. 1. *Pentandria Monogynia.*—*Nat. ord.* *Solanaceæ.*

Cockspur pepper.

Off.—Fructus, capsulæ. The pod.

THIS is an annual plant, a native of South America, but cultivated in large quantities in our West-India islands; and it will even ripen its fruit in this climate.

The pods of this species are long, pointed, and pendulous, at first of a green colour, and afterwards of a bright orange red. They are filled with a dry loose pulp, and contain many small, flat, kidney-shaped seeds. The taste of capsicum is extremely pungent and acrimonious, setting the mouth as it were on fire.

The principle on which its pungency depends, I find, is soluble in water and in alcohol, is not volatile, reddens infusions of turnsole, and is precipitated by infusion of galls, nitrate of mercury, muriate of mercury, nitrate of silver, sulphate of copper, sulphate of zinc, red sulphate of iron (but not blue or green), ammonia, carbonate of potash, alum, but not by sulphuric, nitric, or muriatic acid, or silicized potash.

Cayenne pepper is an indiscriminate mixture of the powder of the dried pods of many species of capsicum, but especially of the

capficum frutescens or bird pepper, which is the hottest of all. Cayenne pepper, as it comes to us in powder from the West Indies, changes infusion of turnsole to a beautiful green, probably owing to the muriate of soda, which is always added to it, and red oxide of lead, with which it is said to be mixed.

Medical use.—These peppers have been chiefly used as a condiment. They prevent flatulence from vegetable food, and have a warm and kindly effect in the stomach, possessing all the virtues of the oriental spices, without, according to Dr. Wright, producing those complaints of the head which the latter are apt to occasion. An abuse of them, however, is supposed to occasion visceral obstructions, especially of the liver. In the practice of medicine, they constitute one of the simplest and strongest stimulants which can be introduced into the stomach; their action not being followed by any narcotic effects. Dr. Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capficum forms an excellent addition, and recommends its use in lethargic affections. It has also been successfully employed as a gargle in cynanche maligna, resisting the use of cinchona, wine, and the other remedies commonly employed. In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capficum have a speedy and happy effect. They redden the parts, but seldom blister, unless when kept on too long. In ophthalmia from relaxation, the diluted juice of capficum is a sovereign remedy. Dr. Adair gave six or eight grains for a dose, made into pills, or prepared a tincture, by digesting half an ounce of the pepper in a pound of alcohol, the dose of which was one or two drachms diluted with water.

CARBO LIGNI. *Ed.*

Charcoal of wood.

Charcoal, as it is commonly prepared, is not a pure oxide of carbon, but contains also a notable proportion of hydrogen, from which it may be purified by exposing it for some time to a strong heat. Münch directs, that for medical use it be reduced to fine powder, and heated in a covered crucible as long as any flame appears on removing the cover, and until it be fully red. It is to be allowed to cool in the furnace, the upper layer of the powder to be removed, and the remainder to be sealed accurately up in ounce phials.

Medical use.—When the pneumatic pathology was in fashion, and phthisis and similar diseases were ascribed to hyper-oxygenation of the system, charcoal was strongly recommended as a power-

ful disoxygenizing remedy, and cases of its successful employment are even recorded. From its acknowledged effects in correcting the putridity of animal substances, it is probable that the virtues ascribed to it of preventing the putrid eructations which take place in some kinds of dyspepsia are better founded. Ten grains may be given for a dose. As an external application, powdered charcoal has been recommended in the cure of inflammation from external causes, gangrene, and all descriptions of fetid ulcers. The good effects of charcoal, or burnt bread, used as a tooth powder, in correcting the bad smell which the breath sometimes acquires from carious teeth are undoubted.

Pharm. prep.—Murias baryta, *Ed.* In this place it will not be superfluous to notice the power ascribed to charcoal of purifying various fetid or discoloured fluids. Lowitz found that it destroyed the adventitious colour and smell of vinegar, carbonate of ammonia, tartaric acid, alcohol, super-tartrate of potash, and other salts, and that it prevented water from becoming putrid at sea, especially when assisted by a little sulphuric acid. Meat which has acquired a maukish, or even putrid, smell, is also said to be rendered perfectly sweet by rubbing it with powdered charcoal.

CARBONAS.

CARBONATE is a generic name for the combinations of the carbonic acid with earths, alkalies, and metallic oxides.

The nature of these substances was totally unknown, until the year 1756, when the genius of Dr. Black at once removed the veil, and displayed to his contemporaries a new and immense field, in which the most important discoveries might be made; and to their ardour in cultivating it, we are indebted for the present state of chemical knowledge.

Before the brilliant epoch we have mentioned, the carbonates were supposed to be simple bodies; and the fact of their acquiring new and caustic properties by the action of fire, was attempted to be explained, by supposing that the particles of the fire combined with them. Dr. Black, however, demonstrated by proofs which carried universal conviction along with them, that these bodies in their caustic state are simple, and that their mildness is owing to their being combined with an acid, to which the name of carbonic is now given.

The most general character of the carbonates is, their effervescing violently when any of the stronger acids is poured upon them. This phenomenon is owing to these acids displacing, by their greater affinity, the carbonic acid, which flies off in the form of a gas.

The carbonates may be also deprived of their carbonic acid,

either by the action of heat alone, or by heating them when mixed with charcoal, which decomposes the carbonic acid by combining with part of its oxygen, so that both the acid and the charcoal are converted into carbonic oxide gas.

The carbonates may be divided into three great families, the alkaline, the earthy, and the metallic.

Family 1. The alkaline carbonates have a urinous taste, tinge vegetable blues green, and are soluble in water, and insoluble in alcohol.

Family 2. The earthy carbonates are insipid, and insoluble in water, but soluble in water saturated with carbonic acid.

Family 3. The metallic carbonates scarcely differ in appearance from the metallic oxides.

We shall have immediately occasion to notice some individuals of each of these families.

CARBONAS BARYTÆ. *Ed. Barytes, Terra ponderosa.*

Carbonate of baryta, Barytes. Heavy spar.

CARBONATED BARYTA is rarely found in nature, and as it was first discovered by Dr. Withering, Mr. Werner gave it the name of Witherite. Its colour is greyish-white, sometimes inclining to milk-white, and sometimes with a slight tinge of yellow, from a mixture of iron, seldom greenish, often invested with a red ochry crust. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphated baryta, frequently rounded, or affecting that form, seldom crystallized. Texture, fibrous; fracture, conchoidal; fragments, long splinters; specific gravity, 4.3 to 4.338. Although it has no sensible taste, it is poisonous. In medicine it is only used for preparing the muriate of baryta. It is found at Anglefark in Lancashire, at Alston-moor in Cumberland, in Scotland, and in Sweden, but is not common.

According to different analysis, its constituents are,

	Acid.		Baryta.		Water.
Withering,	20	+	80		
Pelletier,	22	+	62	+	16
Kirwan,	22	+	78		
Fourcroy,	10	+	90		

CARBONAS CALCIS. *Ed. Creta. Lond. Dub.*

Carbonated lime. Chalk.

THIS is the most common of all minerals, is found under a great variety of forms, and has various names, as chalk, limestone, marble, spar. In form it is either amorphous, stalaetical, or

crystallized. When amorphous, its texture is either foliated, striated, granular, or earthy. The primitive form of its crystals is a rhomboidal parallelopiped. Hardness, lustre, and transparency, various: when transparent, it causes double refraction; specific gravity from 2.315 to 2.78; colour, when pure, white; effervesces violently with muriatic acid, and dissolves in it entirely, or nearly so, forming a colourless solution.

Its different varieties may be arranged under,

1. *Creta alba*. Soft carbonate of lime. Chalk.
2. *Marmor album*. Indurated carbonate of lime. Marble.

They contain about 45 parts of carbonic acid, and 55 of lime.

In medicine it is given to correct acidity in the primæ viæ, especially when accompanied with looseness. Powdered chalk has been externally applied with success to scalds and burns.

Off. prep.—*Aqua aëris fixi, Dub.* *Aqua super-carb. pot. Ed. Dub.* *Carbonas ammon. Ed. Lond. Dub.* *Aqua super-carb. ammon. Ed. Lond. Dub.* *Carb. calcis, ppt. Ed. Lond. Dub.* *Solutio muriatis calcis, Ed.* *Potio carbonatis calcis, Ed. Lond. Dub.* *Trochisci carb. calc. Ed. Lond.* *Pulv. carb. calc. comp. Ed. Lond.* *Pulv. cret. comp. cum opio, Lond.* *Pulv. chelar. cancr. comp. Lond.*

CARBONAS POTASSÆ IMPURUS. *Ed. Cineres clavellati. Lond. Dub.* *Alkali fixum vegetabile. Lixiva.*

Pearl ashes. Potashes. Impure carbonate of potash. Fixed vegetable alkali.

THE potashes of commerce are sent to us from the shores of the Baltic and from America. They are prepared by lixiviating the ashes of vegetables in barrels, first with cold and then with hot water, filtering the ley, and evaporating it to dryness in an iron pot. In this state they still contain some vegetable matter, not perfectly incinerated, which gives them a brown or black colour. To destroy this, and render their colour purer, they are again burnt in a reverberatory furnace. They now get the name of pearl ashes; but even yet they are very impure, and often contain the sulphates of potash and of lime, and the muriate of potash. They are also frequently adulterated with vegetable ashes, sand, and sulphate of potash. The ashes are detected by their difficult and imperfect solution; the sand, by the precipitation of silica in a gelatinous form by the addition of an acid, and the sulphate of potash by its crystallization. All vegetables which grow at a distance from the sea afford potashes by incineration: herbs give the largest proportion, then the leaves of trees, then shrubs, and woods

the least. It formerly had the name of Fixed Vegetable Alkali ; but it is also found, though much more sparingly, both in the animal and mineral kingdoms.

Vauquelin has given a table of the quantity of pure potafs, and of heterogenous matters, contained in 1152 parts of the different potafhes of commerce.

	Potafs.	Sulphate of potafs.	Muriate of potafs.	Insoluble refiduum.	Carb. acid and water.
Ruffian potafhes,	772	65	5	56	254
American do.	857	145	20	2	119
Pearl afhes,	754	80	4	6	308
Potafhes of Treves,	720	165	44	24	199
Dantzic afhes,	603	152	14	79	304
Potafhes of Vosges,	444	148	510	34	304

The potafs was eftimated by the quantity of diluted nitrous acid faturated by it ; the fuphate of potafs by the precipitate formed with nitrate of baryta ; and the muriate of potafs by that formed with nitrate of filver.

All thefe different potafhes, except the laft, may be purified fufficiently for pharmaceutical purpofes, by lixiviating them with a fmall proportion of cold water, and evaporating the ley to drynefs in an iron pot.

Medical ufe.—Carbonate of potafs is ufed in form of lotion, in rachitic and fome cutaneous difeafes, and as a ftimulant to the inactive ftate of the veffels in certain ulcers. It is ufed internally as a diaphoretic or diuretic, and of late in calculous complaints ; but its continued ufe feldom fails to injure the conftitution, or the inteftinal canal.

Off. prep.—Carbonas potaffæ, *Ed. Lond. Dub.* Alcohol ammoniat. *Lond. Dub.* Spirit ammon. foetid. *Lond.*

CARBONAS SODÆ IMPURUS. *Ed. Barilla. Lond. Dub.*

Impure carbonate of foda. *Barilla.* Fixed mineral alkali.

SODA is a very common mineral production. It is the bafis of fea falt ; and combined with carbonic acid, it is found on the furface of the earth in Egypt, Syria, Barbary, Hungary, &c. and is obtained by the incineration of marine vegetables, efpecially the falfolæ foda and kali, the falicornia herbacea, &c. The Spaniards even cultivate thefe in falt marfhes for the fake of the foda. After being cut down, they are dried like hay. A deep pit is then prepared, and a bundle or two of the dried vegetables fet on fire are thrown into it. When well kindled, other bundles are thrown in until the pit is filled. When the incineration is completed, the foda is found in the bottom, caked into a folid mafs,

which is worked like a stony substance. When good, it is firm, hard, heavy, dry, sonorous, spongy, and internally of a blue colour mixed with white spots, does not deliquesce, emits no unpleasant smell on solution, and does not leave a large proportion of insoluble matter. Incinerated soda is mixed with potash, muriate of soda, and other saline matters; mineral soda with clay and other earthy substances. The Egyptian soda was reckoned the best; then the Spanish (barilla); afterwards the Carthaginian; and that prepared from different species of fuci (kelp), is the worst.

But all these carbonated sodas are inferior in purity to those now manufactured in Britain, by decomposing the sulphate of soda.

That commonly used, is obtained by the bleachers as a residuum in their method of preparing oxygenized muriatic acid, by decomposing muriate of soda with sulphuric acid and the black oxide of manganese.

The sulphate of soda is decomposed,

1. By carbonate of potash. Mr. Accum has described the manipulations of this mode. A boiling concentrated solution of about 560 pounds of American potashes is ladled into a boiling solution of 500 pounds of sulphate of soda, agitated together, and the whole quickly heated to ebullition. It is then drawn off into leaden cisterns, lined with thick sheet-lead, and allowed to cool in a temperature which should not exceed 55° .
The fluid is then drawn off, and the mass of salt washed with cold water, to free it from impurities, and again put into the boiler with clean water. This second solution is also evaporated at a low heat, as long as any pellicles of sulphate of potash form on its surface, and fall to the bottom of the fluid. The fire is then withdrawn, and the fluid ladled out into the cistern to crystallize. Unless the fluid be allowed to cool pretty low before it is removed to crystallize, the salt obtained will contain sulphate of potash.
2. By acetate of lime. The acetous acid for this purpose is obtained by distillation from wood, during its conversion into charcoal.
3. By litharge or sub-acetate of lead. Very pure carbonate of soda is prepared by this process in the vicinity of Edinburgh.
4. By decomposing the sulphuric acid by charcoal. About 500 cwt. of sulphate of soda, and 100 cwt. of charcoal are ground together, and the mixture exposed in a rever-

beratory furnace until it becomes pasty. It is then transferred into large casks, and lixiviated. The ley is afterwards evaporated and crystallized. By this, or a similar process, very pure carbonate of soda is manufactured in the west of Scotland.

On the continent, muriate of soda is sometimes decomposed by potash, and sometimes by lime.

Carbonate of soda is an article of the greatest importance in many manufactures.

Medical use.—In medicine, it possesses similar virtues with the carbonate of potash; and from its crystallizability and efflorescence when exposed to the air, it is preferable to it, because its dose may be more accurately ascertained, and it may be given either in the form of powder, or made up into pills.

Off. prep.—Carbonas sodæ, *Ed. Lond. Dub.*

CARDAMINE PRATENSIS. *Ed. Cardamine. Lond.*

Willd. g. 1257. sp. 19. Tetradynamia Siliquosa.—*Nat. ord. Siliquosa.*

Ladies smock.

Off.—Petalum, folium. The petals and leaves.

LADIES SMOCK is a perennial plant, which grows in meadows, sends forth purplish flowers in the spring; and in its sensible qualities resembles the *Sisymbrium nasturtium*.

Medical use.—Long ago it was employed as a diuretic; and it has been again introduced in nervous diseases, as epilepsy, hysteria, chorea, asthma, &c. A drachm or two of the powder is given twice or thrice a-day. It has little sensible operation, except that it sometimes acts as a diaphoretic.

CARUM CARUI. *Ed. Carui. Dub. Caruon. Lond.*

Willd. g. 561. sp. 1. Pentandria Digynia.—*Nat. ord. Umbellifera.*

Caraway.

Off.—Semen. The seeds.

CARAWAY is a biennial umbelliferous plant, cultivated with us in gardens, both for culinary and medicinal use. The seeds have an aromatic smell, and warm pungent taste.

Med. use.—They are employed as a stomachic and carminative in flatulent colics and the like.

Off. prep.—Ol. volat. *Lond. Dub.* Spiritus, *Ed. Lond. Dub.* Decoct. anth. nob. *Ed.* Tinct. cardamomi comp. *Lond. Dub.* Tinct. fen. *Lond. Dub.* Confect. opiat. *Lond.* Emplast. cumini.

CARYOPHILLUS AROMATICUS. See EUGENIA.

CASSIA.

Willd. g. 813. Decandria Monogynia.—Nat. ord. *Lomentaceæ.*

Sp. 18. CASSIA FISTULA. Ed. Syn. Cassia fistularis. Lond. Dub.
Cassia tree.

Off.—Fruētus, pulpa. The fruit and pulp.

THIS tree is indigenous in India and Egypt, and is cultivated in Jamaica. It rises to about thirty feet high, and has long flower spikes, with yellow papilionaceous blossoms.

Its fruit is a cylindrical pod, scarcely an inch in diameter, a foot or more in length: the outside is a hard brown bark, the inside is divided by thin transverse woody plates, covered with a soft black pulp, of a sweetish taste, with some degree of acrimony. There are two sorts of this drug in the shops; one brought from the East Indies, the other from the West, (*Cassia Javanica*?) The canes or pods of the latter are generally large, rough, thick-rhinded, and the pulp nauseous; those of the former are less, smoother, the pulp blacker, and of a sweeter taste; this sort is preferred to the other. Such pods should be chosen as are weighty, new, and do not make a rattling noise, from the seeds being loose within them, when shaken. The pulp should be of a bright, shining, black colour, and have a sweet taste, neither harsh, which happens from the fruit being gathered before it has grown fully ripe, nor sourish, which it is apt to become upon keeping, nor at all mouldy, which, from its being kept in damp cellars, or moistened, in order to increase its weight, it is very subject to be. Greatest part of the pulp dissolves both in water and in alcohol; and may be extracted from the pod by either. The shops employ water, boiling the bruised pod therein, and afterwards evaporating the solution to a due consistence.

Med. use.—The pulp of cassia, from its saccharine and extractive constituents, is a gentle laxative medicine, and is frequently given, in a dose of some drachms, in costive habits. Some direct a dose of two ounces, or more, as a cathartic, in inflammatory cases, where the more acrid purgatives are improper; but in these large quantities it generally excites nausea, produces flatulence, and sometimes gripings of the bowels, especially if the cassia be not of a very good kind: these effects may be prevented by the addition of aromatics, and by exhibiting it in a liquid form.

Off. prep.—Pulpa expressa, *Ed. Lond. EleCt. Ed. Lond. Dub. EleCt. fennæ, Ed. Lond.*

Sp. 24. CASSIA SENNA. Ed. Syn. Senna. Lond. Dub.
Senna.

Off.—Folium. The leaves.

THIS species of cassia is annual, although in its mode of growth it resembles a shrub, and sends out hollow woody stems, to the height of four feet. It grows principally in Upper Egypt, from whence the leaves are brought, dried, and picked from the stalks, to Alexandria in Egypt, and thence imported into Europe. They are of an oblong figure, sharp-pointed at the ends, about a quarter of an inch broad, and not a full inch in length, of a lively yellowish green colour, a faint, not very disagreeable smell, and a sub-acrid, bitterish, nauseous taste. Some inferior sorts are brought from other places: these may easily be distinguished by their being either narrower, longer, and sharper pointed, from Mocha; or larger, broader, and round-pointed, with small prominent veins, from Italy; or large and obtuse, of a fresh green colour, without any yellow cast, from Tripoli.

It has been customary to reject the pedicles of the leaves of fenna, as causing gripes and pains in the bowels; but this is a mere prejudice, for both leaves and pedicles act in the very same way. Neumann from 480 parts of fenna got 143 alcoholic extract, and afterwards 140 watery; and inversely, 245 watery, and only 28 alcoholic, so that it seems to consist chiefly of mucilage and extractive.

Medical use.—Senna is a very useful cathartic, operating mildly, and yet effectually; and, if judiciously dosed and managed, rarely occasioning the ill consequences which too frequently follow the exhibition of the stronger purges. The only inconveniencies complained of in this drug are, its being apt to gripe, and its nauseous flavour.

These are best obviated by adding to the fenna some aromatic substance, as ginger, cinnamon, &c. and by facilitating its operation by drinking plentifully of any mild diluent.

Senna may be given in substance to the extent of about a drachm, but it is rather too bulky, and it is therefore better to divide it into two doses, and to take one half at night, and the other in the morning. It is more conveniently given in the form of infusion, which is generally made by pouring about six ounces of boiling water upon from two to six drachms of senna leaves in a tea-pot, and letting it stand about an hour. Senna ought never to be ordered in decoction, Gren says, because it becomes perfectly inert, from the total dissipation of the nauseous and volatile principle on which its purgative effects depend. The tincture, on account of the menstruum, cannot be given in doses large enough to purge.

Off. prep.—Infusum fennæ, *Lond. Dub.* Inf. fennæ tart. *Lond.* Inf. tamarindi cum fenna, *Ed.* Syrupus mannæ, *Dub.* Tinct. fenn. comp. *Ed. Lond. Dub. Ele&.* *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Lond.*

CASTOR FIBER. *Ed.**Mammalia Rodentia*, Cuvier.

Off.—Materia in folliculis prope anum collecta, *Castoreum* dicta, *Ed.* Castoreum Rossicum, *Dub.* Materia in folliculo prope anum sito collecta, *Lond.*

The Beaver. *Castor.* The substance collected in the follicles near the anus.

THE beaver is strongly characterized by its flat, horizontal, scaly tail. It is an amphibious animal, and is found in the northern parts of Europe, Asia, and America, on the banks of lakes and rivers. In inhabited countries it is a solitary slothful animal, but in desert regions it lives in society; the remarkable manners of which, and the immense works effected by the united labours of all the individuals of their republic, have rendered the natural history of this animal familiar to every one. In both sexes, between the anus and pudendum, there are four follicles, of an oblong shape, smaller above, and larger below, formed of a tough membrane, almost resembling leather. The two largest and undermost of these, which are also connected, and lie parallel and close to each other, contain an oily fluid secretion, which is the substance known by the name of Castor. It is preserved by cutting out the entire bags, and drying them in the smoke.

The best castor comes from Russia, Prussia, and Poland. The cods should be dry, gibbous, roundish, heavy, solid, and filled with a solid substance contained in membranous cells, somewhat tough, but brittle, of a dark-brown colour, of a peculiar, disagreeable, narcotic smell, and a nauseous, bitter, acrid taste. The Canadian castor is of an inferior quality; the cods are smaller, thin, oblong, and much corrugated, and the castor itself has much less smell and taste: what is very old, quite black, and almost destitute of smell and taste, is unfit for use, as well as the counterfeited castor, which is a mixture of various gummy resins and other substances, with a little real castor, artificially interspersed with membranes, and stuffed into the scrotum of a goat. This imposition is easily detected, by the weaker degree of its smell and taste, by chemical analysis, and even by mere external examination; for to the real bags, the two smaller and upper follicles, filled with a fatty matter, are always attached.

Neumann got from 480 parts of castor 140 alcoholic extract, and afterwards 80 watery; inversely, 140 watery, and 20 alcoholic. The first alcoholic extract retained the whole flavour of the castor, as none of it rose in distillation with the alcohol. The distilled water, on the contrary, contained the whole flavour, and the watery extract was merely bitter. Cartheuser obtained from it a volatile oil by distillation.

Medical use.—Castor is an excellent antispasmodic. It is very little heating, and acts particularly on the uterine system.

It is given with advantage,

1. In typhoid fevers.
2. In spasmodic diseases, especially in hysteria and epilepsy, and in cases of difficult parturition, from a spasmodic contraction of the mouth of the uterus after the membranes have burst.
3. In amenorrhœa.

It is exhibited most advantageously in the form of powder, in doses of from 10 to 20 grains, and in clysters, to a drachm. Diluted alcohol extracts its virtues; therefore it may be also given in the form of tincture. But its exhibition in the form of extract or decoction is improper.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CENTAUREA BENEDICTA. *Ed. Carduus Benedictus. Lond. Dub.*

Willd. g. 1548. sp. 39. Syngenesia Polygamia frustranea.—*Nat. ord. Compositæ capitatæ.*

Blessed Thistle.

Off.—Herba, folium. The leaves or plant.

THIS is an annual plant, indigenous in the Grecian islands, and cultivated in gardens. It flowers in June and July, and perfects its seeds in the autumn. The herb should be gathered when in flower, quickly dried, and kept in a very dry airy place, to prevent its rotting, or growing mouldy, which it is very apt to do. The leaves have a penetrating bitter taste, not very strong or very durable, accompanied with an ungrateful flavour, from which they are in a great measure freed by keeping. Water extracts, in a little time, even without heat, the lighter and more grateful parts of this plant; if the digestion be continued for some hours, the disagreeable parts are taken up. A strong decoction is very nauseous and offensive to the stomach. Rectified spirit gains a very pleasant bitter taste, which remains uninjured in the extract.

Neumann got from 1920 parts 270 alcoholic, and afterwards 390 watery extract; and inversely, 600 watery, and 60 alcoholic.

Med. use.—The virtues of this plant seem to be little known in the present practice. The nauseous decoction is sometimes used to provoke vomiting, and a strong infusion to promote the operation of other emetics. But this elegant bitter, when freed from the offensive parts of the herb, may be advantageously applied to other purposes. Excellent effects have been frequently experienced from

a slight infusion of carduus, in loss of appetite, where the stomach was injured by irregularities. A stronger infusion, made in cold or warm water, if drunk freely, and the patient kept warm, occasions a plentiful sweat, and promotes the secretions in general.

The extract prepared, by evaporating the expressed juice, with the addition of a little alcohol, to prevent it from becoming mouldy, has been strongly recommended in the catarrh of children.

The seeds of this plant are also considerably bitter, and have been sometimes used with the same intention as the leaves.

CEPHAELIS IPECACUANHA. *Ipecacuanha.* Lond. Ed. Dub.

Willd. g. 357, species nova. Pentandria Monogynia.—Nat. ord. *Aggregata.*

Ipecacuan.

Off.—*Radix.* The root.

IPECACUAN, in the language of South America, means vomiting root, and is applied to various vegetables which possess that property in any remarkable degree; hence the confusion and contradictions which have long prevailed concerning the plant which furnishes our officinal Ipecacuan: but this confusion is increased by several varieties of Ipecacuan being found in the shops.

1st, The ash-coloured, or Peruvian ipecacuan, is a small wrinkled root, bent and contorted into a great variety of figures, brought over in short pieces, full of wrinkles and deep circular fissures, quite down to a small white woody fibre that runs in the middle of each piece: the cortical part is compact, brittle, looks smooth and resinous upon breaking: it has very little smell; the taste is bitterish and subacid, covering the tongue as it were with a kind of mucilage. This, according to Mutis, is obtained from the *Psycotria emetica*, and is that commonly used.

2d, The brown ipecacuan is small, and somewhat more wrinkled than the foregoing; its bark is of a brown or blackish colour without, and white within; this is brought from Brazil, and is the root of a *cephaelis*, which is perennial, and grows in moist shady situations. A complete monography of it, and an excellent plate, were published, in the sixth volume of the Transactions of the Linnæan Society, by Professor Brotero, who calls it the *Callicocca Ipecacuanha*; but the genus *Callicocca* has been united by Willdenow with that of *Cephaelis*, to which we have therefore referred it. The plate of Brotero corresponds with that published in Woodville's Medical Botany, vol. iii, from a plant sent in spirits from Brazil by Governor Philips to Sir Joseph Banks, but which unfortunately was not

in flower, and also with the rude draught of Piso, who first examined it. It has been sometimes observed, even in a small dose, to produce violent effects.

3d, The white sort is woody, has no wrinkles, and no perceptible bitterness in taste. It is probably the root of a viola. Though taken in a large dose, it has scarcely any effect at all.

Besides these, the name of Ipecacuan is given to various species of *Cynanchum*, *Asclepias*, *Euphorbia*, *Dorstenia*, and *Ruellia*. With regard to their comparative strengths, Decandolle says, that vomiting is produced by 22 grains of the *Cynanchum Ipecacuanha*, 24 of the *Psycotria emetica*, 60 to 72 of the *Viola calceolaria*, and one to three drachms of the *Viola Ipecacuanha*.

Ipecacuan was first brought into Europe about the middle of last century, and an account of it published about the same time by Piso; but it did not come into general use till about the year 1686, when Helvetius, under the patronage of Lewis XIV, introduced it into practice.

Neumann got from 7680 parts 1440 alcoholic, and afterwards 1880 watery extract; and inversely, 2400 watery, and 600 alcoholic. I find that the tincture of ipecacuan does not redden infusion of lithmus, or precipitate a solution of gelatin; that it is precipitated by water, by red sulphate of iron, and readily acquires a green colour from excess of the chalybeate; and by infusion of gall nuts. According to Dr. Irvine, the watery solution is more emetic than the alcoholic, the decoction than the distilled water, and the cortical than the ligneous part. Others have found, that the resinous part is more apt to act upon the intestinal canal, and to operate by stool. By long continued boiling, it becomes almost inert; and the emetic property of ipecacuan is most effectually counteracted by means of the acetic acid, insomuch that thirty grains of the powder taken in two ounces of vinegar, produced only some loose stools.

From these experiments it evidently appears, that ipecacuan contains cinchonin and a resin, and that its emetic property does not depend upon the latter, although we can scarcely attribute it to the former, as in other substances it does not manifest any emetic property. It is therefore probably owing to some other principle soluble in water and alcohol.

Med. use.—The primary effect of ipecacuan is that of stimulating the stomach. If the dose be sufficiently large, it excites vomiting, by inverting the peristaltic motion of the stomach and duodenum; in a smaller dose it only produces nausea, and operates by stool, and in still smaller doses it gently stimulates the stomach, increases the appetite, and facilitates digestion. Its secondary effects depend on the sympathy of other parts with

the stomach; and in this way only can we explain its action as an antispasmodic, diaphoretic, expectorant, and in checking hæmorrhagies. Its beneficial effects, in some cases, also seem to be owing to the general concussion given to the whole system during the action of vomiting.

Ipecacuan, properly administered, often proves serviceable,

1. In intermittent fevers. It has frequently succeeded in stopping these, when given about an hour before an accession was expected, and also when given so as to produce vomiting at the time of an accession, or at the end of the cold stage.
2. In continued fevers. We have never seen more decidedly beneficial effects from the use of any medicine whatever, than from the exhibition of ipecacuan in the commencement of typhus fever. An emetic, succeeded by a diaphoretic regimen, when administered sufficiently early in this disease, very frequently cuts it short at once; and when it fails in this desirable object, it always has a beneficial influence on the progress of the fever.
3. In inflammatory diseases, rheumatism, bubo, swelled testicle.
4. In exanthematous diseases, when the eruption is disposed to recede.
5. In hæmorrhagies, when given in nauseating doses.
6. In profluvia, especially in dysentery, so much so, that it was formerly esteemed a specific against that disease. But Cullen attributes its good effects, in this instance, to its producing a steady determination of the peristaltic motion of the intestines downwards, when given in repeated small doses.
7. In many spasmodic diseases; in epilepsy, asthma, dyspnoea, pertussis, chronic diarrhoea, hysteria, melancholy, mania.
8. In cachectic diseases, as in some kinds of dropsy.
9. In impetiginous diseases; in jaundice.
10. In local diseases; in amaurosis, and several of the dysorexiæ.
11. Lastly, in every instance when we wish to evacuate the stomach, as when it is overloaded with food, or when poison, especially opium, has been swallowed.

The use of ipecacuan, as an emetic, is contraindicated,

1. Where there is a disposition to hæmorrhagy.

2. Where there is an increased flow of blood towards the head.
3. In very irritable subjects.
4. In pregnant women, and persons afflicted with hernia.

Ipecacuan is exhibited,

1. In substance; in powder. Full vomiting will generally be produced in an adult by a scruple or half a drachm; and though less might answer the purpose, fortunately an over dose is scarcely attended with any inconvenience, as the whole of it is vomited with the contents of the stomach as soon as it operates. The vomiting is promoted and facilitated by drinking copiously of warm watery fluids. On the contrary, when vomiting is not intended, liquids must be rather drunk sparingly, and the dose must be diminished to a grain or less. In such small doses it is conveniently combined with any proper adjunct, in the form of powder, pill, or bolus.
2. In infusion. One drachm may be infused in four ounces of water, and taken in repeated doses till it operate.
3. Infused in wine.

Ipecacuan not only checks the narcotic effects of opium, and is therefore one of the best antidotes for its poison, but reciprocally the emetic powers of ipecacuan are checked by the addition of opium, and the combination operates by increasing the cuticular discharge.

Off. prep.—Vinum Ip. *Ed. Lond. Dub.* Pulv. Ip. et opii, *Ed. Lond. Dub.*

CERA.

A. CERA FLAVA. *Ed. Lond. Dub.*

Yellow wax.

FOR this useful substance we are indebted to the common honey bee (*apis mellifica*), an insect belonging to the class of *Hymenoptera mellita* of Cuvier. It is, however, a vegetable production, and is collected by the bees from the surface of leaves, and the antheræ of flowers. They employ it to form the combs in which the honey and larvæ are deposited.

It is found in the shops in round cakes, which are formed by melting the combs, after all the honey has been expressed from them, in hot water. The wax swims above, and the impurities either sink to the bottom, or are dissolved in the water. When

recent, it is tenacious, but brittle, of a yellow colour, and sweet honey-like smell; dry, not greasy, to the feel; insoluble in water, alcohol, and ether; soluble in the fat oils and alkalies; fusible and inflammable. In selecting it, we should observe that the cakes be brittle, have a pleasant yellow colour, an agreeable smell, no taste, do not adhere to the teeth when chewed, and burn entirely away. When adulterated with resin, the fraud is detected by its taste, and the action of alcohol, which dissolves the resin. When mixed with pease meal or earthy substances, it is more brittle, of a paler colour, and may be separated from them by liquefaction and straining. When combined with tallow, it becomes less brittle, but at the same time softer, and has an unpleasant smell.

Pharm. prep.—Oxidum antim. vitrif. cum cera, *Ed.* Ungt. res. flav. *Lond. Dub. Ed.* Cerat. res. flav. *Lond. Dub.* Emplast. Ceræ, *Lond. Dub. Ed.* Ungt. picis, *Ed.* U. picis, Burgund. *Lond. Dub.* Emplast. cumini, *Lond.* Ungt. inf. mel. vesic, *Ed.* Empt. mel. ves. *Ed.* Emp. mel. ves. comp. *Ed.* Emp. assæ foet. *Ed.* Empl. gummos, *Ed.* Cer. saponis, *Lond. Dub.* Cer. lith. acet. comp. *Lond. Dub.* Cer. lap. calam. *Lond. Dub.* Empl. oxidi ferri rubri, *Ed.*

B. CERA ALBA. *Lond. Dub. Ed.*

White wax.

THE yellow colour of bees wax, and its peculiar smell, may be destroyed by the combined action of water, air, and the sun's rays. In the process for bleaching wax, we, therefore, extend its surface as much as possible, by melting it and forming it into thin plates, which are fully exposed to the sun's rays, upon linen stretched in frames, and repeatedly moistened, until they acquire the whiteness desired. It is then usually melted into thin discs. White wax is more brittle, less fusible, and heavier than yellow wax. It is sometimes mixed with white oxide of lead, or with tallow. For medical use, it has no advantage over yellow wax.

Medical use.—When taken internally, wax agrees in its effects with the fat oils, and though less frequently prescribed in this way, it is preferable, being less apt to become rancid. Poerner recommends it as an excellent remedy in diseases of the intestines, attended with pain, excoriation, and obstinate diarrhœa. He gave a scruple, or half a drachm of wax, three or four times a-day, in the form of an emulsion, by melting it first with some fixed oil, and then mixing it with a decoction of groats by trituration with the yolk of an egg. But by far its principal use is for the formation of cerates, ointments, plasters, &c.

Off. prep.—Linam. simp. *Ed.* Ung. simp. *Ed.* Ung. sperm. ceti, *Lond. Dub.* Ung. ceræ, *Lond. Dub.* Cerat. simp. *Ed.* Cerat. sper. ceti. *Lond. Dub.* Ung. cerussæ acet. *Lond. Dub.*

CERVUS ELAPHUS. *Syn. Cervus. Lond. Mammalia ru-
minantia.*

The stag or hart.

Off.—Cornu, Cornu cervinum. The horns.

THE male has two round solid horns on his forehead, with several conical branches, the number of which ascertain the age of the animal to which they belong. These horns fall off and are renewed every year. When first produced, they are soft, full of blood vessels, and covered with a velvety skin, but they soon lose their covering, and become hard, compact, and bony.

In their nature they do not seem to differ from bone except in containing a larger proportion of cartilage. They afford a very considerable quantity of gelatine by decoction with water, and hartshorn shavings are still employed in domestic economy for furnishing a nutritious and demulcent jelly. By the action of fire, their products are the same with those of animal substances in general; and they were formerly so much used for the preparation of ammonia, that it was commonly called Salt or Spirit of Hartshorn. By burning they are totally converted into phosphate of lime.

Off. prep.—Liquor volat. sal, et oleum, cornu cervi, *Lond. Dub.* Cornu cervi ust. *Lond. Dub.* Oxidum antimon. cum phosphat. calcis, *Ed. Lond. Dub.*

CHIRONIA CENTAURIUM. *Ed. Syn. Centaureum minus.
Dub. Lond. Gentiana certaureum.*

Willd. g. 394, sp. 9. Pentandria Monogynia.—*Nat. ord. Rotacea.*
Smaller Centaury.

Off.—Summitas florens, Cacumen. The flowery heads.

THIS plant is annual, and grows wild in many parts of England on barren pastures. It flowers between June and August. The corolla is said to have no taste; and therefore the herb, which is intensely bitter, should be preferred to the flowering tops which derive their virtues only from the stalks connected with them. It agrees in every respect with other pure bitters.

Neumann got from 480 parts 210 alcoholic, and 140 watery extract, and inversely 320 watery, and 40 alcoholic.

CINCHONA.

Willd. g. 346. Pentandria Monogynia.—*Nat. ord. Contorta.*

*Sp. 1. CINCHONA OFFICINALIS. Ed. C. cordifolia, Mutis.
Cinchona. Lond. Cortex Peruvianus. Dub.*

Official Cinchona.

Off.—Cortex. The bark, commonly called Peruvian bark, which the Edinburgh college enumerates three varieties,

- a. The common.
- b. The yellow,
- c. The red.

By the recent observations of the Spanish botanists, it is now, however, ascertained, that these are not only the barks of distinct species of cinchona, but that probably each of them is indiscriminately taken from several different species. Ruiz and Pavon have described fifteen species natives of Peru and Chili, and if to them we add those of Tafalla and Vahl, twenty-five distinct species have been described, of which seven have been found in North America in the neighbourhood of Santa Fé, by Mutis. Cinchona, considered as a genus, is a mountainous tree, and is never found in the plains. It grows to a great height, and formerly its trunk was often thicker than a man's body. But since its bark has come into such general use, few trees are to be seen thicker than the arm. Indeed, there is reason to fear, that it will become still more scarce, as no attention is paid to its cultivation, and the trees always die after being stripped of their bark. This operation is performed in the dry season, from September to November. The bark is then carefully dried in the sun, and packed in skins, which contain from 100 to 150 pounds, and are called by the Spaniards zeronne. In these, coarse and fine pieces of the same kind of bark are promiscuously mixed, but they are afterwards sorted.

1. Common pale bark. This is said to be the bark of the cinchona cordifolia of Mutis, under which he includes the hirsuta, ovata, purpurea, and micrantha of the Flora Peruviana, the officinalis of Linnæus, and the pubescens of Vahl.

In commerce we find several varieties of the common pale bark, the most remarkable of which come from Loxa, the quilled bark, and from Guanaco, the flat bark.

The bark which comes from Loxa consists of thin, singly or doubly rolled, pieces, four or five inches long, and scarcely a line in thickness; externally rough, of a greyish brown colour, and generally covered with a kind of lichen; internally of a cinnamon colour. Its fracture should not be fibrous or powdery, but even and shining. It has a peculiar aromatic smell, and a pleasant, bitter, astringent taste.

The bark which comes from Guanaco consists of much thicker, coarser, and flatter, pieces; externally of a dark brown or almost black colour, but internally it has the same cinnamon colour; and in its resinous fracture, smell, and taste, it exactly resembles the former. When genuine, both varieties are excellent remedies, although the former be generally preferred on the continent, and the latter in Britain.

2. Yellow Peruvian bark. This variety of bark has only

been introduced into European practice since 1790, when it was sent from Santa Fè by Mutis. It is the bark of his *cinchona lacifolia*, under which he includes the *nitida*, *glabra*, or *lanceolata*, *fusca*, or *rosea*, *angustifolia*, or *tunita*, the *officinalis* of Condamine and Vahl. It consists of pieces about six inches in length, thicker, and less rolled up than the common bark. Its internal surface is of a deeper red. It sometimes wants the epidermis, which is often as thick as the bark itself. It is lighter and more friable than the former variety; its fracture is fibrous; and when reduced to powder, its colour is paler. Its taste is much more bitter, astringent, and stronger, but its smell is weaker. Its decoction when hot is redder, but when cold, paler. Its solutions strike a deeper colour with sulphate of iron. It contains more of the active constituents than either of the others, but less gum than the common, and less resin than the red. It is much more powerful than the preceding species, and, according to Mutis, is the only one which is directly febrifuge. The epidermis should always be removed before it be powdered.

3. Red Peruvian bark is obtained from the *cinchona magnifolia* of Ruiz and Pavon, the *oblongifolia* of Mutis. It occurs generally in much larger, thicker, flatter pieces, but sometimes also in the form of quills. It is heavy, firm, sound, and dry; friable between the teeth; does not separate into fibres; and breaks, not shivery, but short, close, and smooth. It has three layers: the outer is thin, rugged, of a reddish brown colour, but frequently covered with mossy matter; the middle is thicker, more compact, darker coloured, very resinous, brittle, and yields first to the pestle: the inmost is more woody, fibrous, and of a brighter red. Its powder is reddish, like that of Armenian bole.

Its astringency and bitterness are more intense, and it contains more resin than the pale bark. It is not, however, allowed by Mutis to be like the yellow bark, directly febrifuge. It is said to be more frequently adulterated.

The great price of *Cinchona* bark has sometimes tempted dishonest men to adulterate it with other similar and less powerful barks, and, what is still more blameable, with genuine bark, from which the active constituents have been entirely extracted by decoction with water.

In selecting *Cinchona* bark, we must therefore see, that, besides the characteristics already noticed, it be dense, heavy, and dry, not musty or spoiled by moisture, and that a decoction made of it have a reddish colour when warm, but when cold become paler, and deposite a brownish red sediment. Those pieces whose taste is simply intensely bitter or very astringent, or nauseous, or merely mucilaginous, whose surface is smooth or polished, of a dark

colour, or pale yellow, or red, which are tough or spongy, whose fracture is fibrous, woody, or powdery, and their internal colour white or grey, are to be rejected.

There are few vegetable substances which have been so much subjected to analysis as Cinchona bark, and yet our knowledge of it is extremely imperfect. Neumann got from 7680 parts 640 alcoholic and afterwards 300 watery extract, and inversely 336 watery, and 600 alcoholic. Lewis observed that the decoction became turbid on cooling, but ascribed this to the separation of resin, which he supposed had been melted out by the heat. He also ascertained that the bitterness remained dissolved while the astringency resided chiefly in this precipitate, and that the precipitate was soluble in alcohol. In his experiments chalybeate solutions struck a deep green with the decoction of bark. Dr. Irving, however, remarked, that recent preparations of bark struck a black colour, while those which had been kept some time became green. Seguin's discovery at last enabled chemists to ascertain the astringency of different substances with more precision; and Dr. Maton and Mr. Davy found that Cinchona bark contained very little tannin. Dr. Maton also discovered, that solutions of cinchona were precipitated by tannin, and Seguin hence concluded that it contained gelatine. This last opinion, however, I proved to be erroneous, and to depend upon a principle, to which, as in its properties it did not coincide with any other which had hitherto been described, I gave the name of Cinchonin. Tincture of cinchona is precipitated by water, the precipitate is easily separated by filtration, the filtered solution is copiously precipitated by infusion of gall nuts, and slightly by solution of gelatine. The latter precipitate in every respect is the same with that produced in other astringents by gelatine, and therefore indicates the presence of tannin; the former is soluble in alcohol, which is an additional proof that it is not to be ascribed either to the presence of gelatine or of starch. With a very small proportion of red sulphate of iron, it acquires a purplish colour, with a somewhat larger proportion, a black, which, on the slightest further addition of the chalybeate, becomes a full green. The different colours produced by different proportions of the chalybeate account for the different results obtained by Dr. Lewis and Dr. Irving, and prove, from the green colour which the latter observed in experiments with old preparations, while the recent ones struck a black, that the principle on which the change of colour depends is exceedingly destructible. In the filtered decoction, infusion of galls produced a pulverulent, and solution of gelatine a copious, filamentous precipitate.

The principles therefore proved to exist in Cinchona bark, seem to be cinchonin, tannin, an acid (the gallic?), and a matter pre-

capitable from the tincture by water (a resin?). Its aroma has also been proved to depend on a very minute proportion of volatile oil.

Medical use.—On dead animal matter it acts as an antiseptic, and on the living body it acts moreover as a stimulant, tonic, and antispasmodic. The discovery of its medical virtues was, in all probability, the result of accident; and in fact, according to some, the Peruvians learned the use of the bark by observing certain animals affected with intermittents instinctively led to it; while others say, that a Peruvian having an ague, was cured by happening to drink of a pool which, from some trees having fallen into it, tasted of cinchona: and its use in gangrene is said to have originated from its curing one in an aguish patient. About the year 1640, the lady of the Spanish viceroy, the Comitissa del Cinchon, was cured by the bark, which was therefore called Cortex or Pulvis Comitissæ, Cinchona, &c.; and from the interest which Cardinal de Lugo and the Jesuit fathers took in its distribution, Cortex or Pulvis Cardinalis de Lugo, Jesuiticus, Patrum, &c.; from the place where it was originally found, Peruvian bark, or simply, from its pre-eminence, Bark.

On its first introduction into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became very universally established.

It was first introduced for the cure of intermittent fevers; and these, when properly exhibited, it rarely fails to cure. But there have been considerable differences with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it between the fits; the dose being the more frequent and larger according to their frequency; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, upon the whole appears preferable, from being best suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents it seems even hardly necessary.

It is now given, from the very commencement of the disease, without previous evacuations, which, with the delay of the bark, or under doses of it, by retarding the cure, often seem to induce abdominal inflammations, scirrhus, jaundice, hectic, dropsy, &c. symptoms formerly imputed to the premature or intemperate use of the bark, but which are best obviated by its early and liberal use. It is to be continued not only till the paroxysms cease, but till the natural appetite, strength, and complexion return. Its use is then to be gradually left off, and repeated at proper intervals to secure against a relapse; to which, however unaccountable, there

often seems to be a peculiar disposition; and especially when the wind blows from the east. Although, however, evacuation rather counteracts the effects of cinchona in the use of intermittents, yet, previous to its use, it is advisable to empty the alimentary canal, particularly the stomach: and on this account good effects are often obtained from premising an emetic.

It is a medicine which seems not only suited to both formed and latent intermittents, but to that state of fibre on which all rigidly periodical diseases seem to depend; as periodical pain, inflammation, hæmorrhagy, spasm, cough, loss of external sense, &c.

Cinchona is now used by some in all continued fevers; at the same time attention is paid to keep the bowels clean, and to promote when necessary, the evacuation of redundant bile, always, however, so as to weaken the patient as little as possible.

In confluent small-pox, it promotes languid eruption and supuration, diminishes the fever through the whole course of it, and prevents or corrects putrescence and gangrene.

In gangrenous sore throats, and indeed in every species of gangrene, it is much used, both externally and internally.

In contagious dysentery, after due evacuation, it has been used, taken internally and by injection, with and without opium.

In all those hæmorrhagies called passive, and which, it is allowed, all hæmorrhagies are very apt to become, and likewise in other increased discharges, it is much used; and in certain undefined cases of hæmoptylis, some allege that it is remarkably effectual when joined with an absorbent.

It is used for obviating the disposition to nervous and convulsive diseases; and some have great confidence in it, joined with sulphuric acid, in cases of phthisis, scrofula, ill-conditioned ulcers, rickets, scurvy, and in states of convalescence. In these cases, it is proper to conjoin it with a milk diet.

In dropsy, not depending on any particular local affection, it is often alternated or conjoined with diuretics or other evacuants, and by its early exhibition after the water is once drawn off, or even begins to be freely discharged, a fresh accumulation is prevented, and a radical cure obtained.

Mr. Pearson of the Lock hospital praises very highly the powers of this remedy in different forms of the venereal disease; in reducing incipient bubo, in cleansing and healing ulcers of the tonsils, and in curing gangrenous ulcers from a venereal cause. But in all these cases mercury must also be given to eradicate the venereal virus from the system.

Peruvian bark may be exhibited,

1. In substance.

The best form of exhibiting this valuable remedy is in the state

of a very fine powder, in doses of from ten grains to two drachms and upwards. Mutis and Zea say, that two drachms of true yellow bark in powder are sufficient to prevent the access of an intermittent, while, to produce the same effect, it requires the decoction of two ounces. Nay, even the residuum of an infusion is capable of curing agues, provided it be given in a larger dose, than the entire powder. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk, or mixed with some viscid substance, as currant jelly. Its taste, which is disagreeable to many people, is best avoided by taking it immediately after it is mixed up; for by standing any time, it is communicated to the vehicle. In this respect, therefore, it is better for the patients to mix it up themselves, than to receive it from the apothecary already made up into a draught with some simple distilled water, or into an electuary with a syrup. A much more important objection to this form of giving Cinchona is, that some stomachs will not bear it, from the oppression, and even vomiting, which in these cases it excites. We must endeavour to obviate this inconvenience by the addition of some aromatic, and by giving it in small doses more frequently repeated. If we are unable to succeed by these means, we must extract the most active constituents of the bark by means of some menstruum. It has therefore long been a pharmaceutical problem to discover which menstruum extracts the virtues of Cinchona most completely. But the active constituents of this remedy, according to the best and latest analysis, are cinchonin, tannin, and gallic acid, combined with some mucilage and resin. Of these the two last are not soluble in any one menstruum; but they most probably contribute very little to the powers of the medicine. The three other constituents, on the contrary, on which all its activity depends, taken singly, are all of them very soluble, both in water and in alcohol, and in every mixture of these. But it would be contrary to analogy to suppose, that these substances should subsist so intimately mixed as they must be in an organic product, without exerting upon each other some degree of chemical affinity, and forming combinations possessed of new properties. Accordingly, we find, whether it arise from this cause, or merely from the state of aggregation, that neither water nor alcohol extract these constituents from Cinchona bark in the same quantity in which they are able to dissolve them separately, and that we must have recourse to direct experiment to determine the degree of action possessed by each menstruum upon it. With this view many experiments have been made, and by very able chemists. But most of them were performed when the science of chemistry was but in its infancy; and even at this time that branch of it which relates to these sub-

stances is so little understood, that the results of the latest experiments are far from conclusive.

2. In infusion.

To those whose stomachs will not bear the powder, this is the best form of exhibiting Cinchona bark. Water, at a given temperature, seems capable of dissolving only a certain quantity, and therefore we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing them to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and allow it to cool slowly. After standing a sufficient length of time, the infusion is decanted off for use. The propriety of this process may, however, be doubted, for if a cold infusion be boiled, or even gently heated, it acquires a deeper colour, and lets fall a resinous matter, in part insoluble in alcohol and in water. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled. Therefore, in some instances, we prepare the infusion with wine; and it fortunately happens that very often the use of the menstruum is as much indicated as that of the solvent. Cinchona also prevents wine from becoming acid, but in the course of a few days throws down its colouring matter, as gall nuts and charcoal do.

3. In tincture.

The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large doses to exert its peculiar virtues. It is, however, a powerful stimulant.

4. In decoction.

Water of the temperature of 212° is capable of dissolving a much larger proportion of the soluble parts of Cinchona bark than water at 60° . But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of matter dissolved. Besides, at a boiling temperature, some of the active constituents are dissipated, while others absorb oxygen rapidly from the atmosphere, and are converted into what seems to be an insoluble and inert resinous substance.

5. In extract.

In this preparation we expect to possess the virtues of Cinchona bark in a very concentrated state. The principal objections to its use are its great expence, and the decomposition and destruction of the active constituents of the bark during the preparation, even when most carefully conducted. Not above half the weight of

the dry extract is again soluble in water. It is convenient for the formation of pills and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Externally Cinchona bark is used in substance, as an application to ill-conditioned, carious, or gangrenous ulcers.

In the form of clyster it may be given in substance, decoction, or extract. The powder is used as a tooth powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash.

To increase the power of Cinchona bark, or to direct its efficacy to a particular purpose, or to correct some inconveniencies occasionally produced by it, it is frequently combined with other remedies. When it produces vomiting, carbonic acid forms a useful addition; when it purges, opium; when it oppresses the stomach, aromatics; and when it induces costiveness, rhubarb. But we are afraid that many additions are made, chiefly saline substances, of which the effects are not at all understood. Sulphuric acid, super-sulphate of alumina and potash (alum), muriate of ammonia, carbonate of potash, tartrate of potash, tartrate of antimony and potash (tartar emetic), iron, lime-water, astringents, &c. have been frequently prescribed with it; but we know that in many of these mixtures decomposition occurs, which renders the whole either inactive, or completely deceives us with regard to the expected effects.

Off. prep.—Infus. *Ed. Dub.* Decoct. *Ed. Lond. Dub.* Tinctura, *Ed. Lond. Dub.* Tinct. comp. *Lond. Dub.* Tinct. ammon. *Lond.* Extract. *Ed. E. molle, Lond. Dub. E. durum, Lond. Dub. E. cum resina, Lond. Vin. gent. comp. Ed.*

Sp. 4. CINCHONA CARIBÆA. Ed.

Cinchona of the Caribæan islands.

Off.—Cortex. The bark.

THIS tree is found in the Caribæan islands. It grows to a very large size. Dr. Wright, to whom we are indebted for all our knowledge of it, found some in the parish of St. James's, Jamaica, fifty feet high, and proportionally thick. The wood is hard, clouded, and takes a fine polish. The bark of the large trees is rough, the cuticle thick and inert, and the inner bark thinner than that of the young trees, but more fibrous. The bark is brought to us in pieces about a span in length, rolled together, and a line or half a line in thickness, of a brown colour on the surface, which is most commonly covered with white lichens: internally it is of a dark-brown colour, and very fibrous in its fracture. It has at first a sweetish taste, but after being chewed sometime it

becomes extremely nauseous and bitter. Dr. Wright says he made use of this bark in all cases where Peruvian bark was indicated, and with the greatest success. It has often been confounded with the *cinchona floribunda* (Willdenow's 7th species), so excellently analysed by Fourcroy, under the title of the *Cinchona* of St. Domingo, and which, taken internally, is apt to excite vomiting and purging.

CISSAMPELOS PAREIRA. *Pareira Brava. Lond.*

Pareira brava.

Off.—*Radix.* The root.

Dioecia Monadelphia.—Nat. ord. *Sarmentacea.*

THIS is a perennial climbing plant, which grows in the West-India islands, and in South America. The root, which is official, is brought to us from Brazil, in pieces of different sizes, some no bigger than one's finger, others as large as a child's arm; it is crooked, and variously wrinkled on the surface; outwardly of a dark colour, internally of a dull yellowish, and interwoven with woody fibres; so that, upon a transverse section, a number of concentric circles appear, crossed with fibres, which run from the centre to the circumference. It has no smell; the taste is a little bitterish, blended with a sweetness like that of liquorice. Neumann got from 480 parts 123 alcoholic, and 60 watery extract; and inversely, 140 watery, and 66 alcoholic. Nothing rose in distillation.

Medical use.—The root is highly extolled by the Americans and Portuguese, in a great variety of diseases, particularly against suppressions of urine, nephritic pains, and calculus. Geoffroy also found it useful in nephritic disorders, in ulcers of the kidneys and bladder, in humoral asthmas, and in some species of jaundice. The common people of Jamaica use a decoction of the roots for pains and weakness of the stomach, proceeding from relaxation. The dose of the root in substance is from twelve grains to half a drachm; in decoction, to two or three drachms.

CISTUS CRETICUS. *Ladanum. Lond.*

Cretan Cistus. *Ladanum.*

Off.—*Resina.* The resin.

Willd. g. 1048, *sp.* 13.—Nat. ord. *Ascyroidea.*

THIS is a perennial shrub, which grows in Syria, and more especially in the Grecian islands.

This resin is said to have been formerly collected from the beads of goats which browsed the leaves of the cistus: at present a kind of rake, with several straps or thongs of skins fixed to it, is drawn lightly over the shrub, so as to take up the anctuous

juice, which is afterwards scraped off with knives. It is rarely met with pure, even in the places where it is produced; the dust, blown upon the plant by the wind, mingling with the viscid juice, and the inhabitants also being said to mix it with a certain black sand. In the shops two sorts are met with: the best (which is very rare) is in dark-coloured, almost black, masses, of the consistence of a soft plaster, which grows still softer upon being handled; of a very agreeable smell, and of a light, pungent, bitterish, taste: the other sort is harder, not so dark-coloured, in long rolls coiled up: this is of a much weaker smell than the first, and has a large admixture of a fine sand, which in the ladanum examined by the French academy, made up three fourths of the mass; and that found in the shops seems even more sandy. What Neumann examined, however, gave him 5400 alcoholic, and 480 watery; and inversely, 960 watery, and 4960 alcoholic extract, from 7680 parts. In distillation water carries over a volatile oil, and alcohol distilled from it becomes milky on the addition of water.

Off. prep.—Emplast. lad. comp. *Lond.* E. picis Burgund. *Lond.*

CITRUS.

Polyadelphia Icosandria.—Nat. ord. *Pomaceæ*.

Sp. CITRUS AURANTIUM. *Ed.* *Syn.* *Aurantium Hispalense.* *Lond.* *Dub.*

Seville orange.

Off.—Fructûs, succus, et ejus cortex exterior, *Ed.* Folium, flos, fructûs, succus, et cortex exterior, *Lond.* Fructûs, succus, et cortex exterior, fructus immaturus, florum aqua stillatitia, *Dub.* The leaves, flowers, distilled water, and essential oil of the flowers, the juice and outer rind of the fruit, and the unripe fruit.

THE orange tree is a beautiful evergreen, a native of Asia, but now abundantly cultivated in the southern parts of Europe, and in the West-India islands. There are several varieties of this species, but they may be all referred to the bitter or Seville orange, and the sweet or China orange.

The leaves are neither so aromatic nor so bitter as the rind of the fruit.

The flowers (flores naphæ) are highly odoriferous, and have been for some time past in great esteem as a perfume; their taste is somewhat warm, accompanied with a degree of bitterness. They yield their flavour by infusion to rectified spirit, and in distillation both to spirit and water (aqua florum naphæ): the bitter matter is dissolved by water, and on evaporating the decoction, remains entire in the extract.

A very fragrant red-coloured oil, distilled from these flowers, is brought from Italy, under the name of *Oleum* or *Essentia Neroli*; but oil of behen, in which orange flowers have been digested, is frequently substituted for it: the fraud, however, is easily detected, as the real oil is entirely volatile, and the adulterated is not.

The juice of oranges is a grateful acid liquor, consisting principally of citric acid, syrup, extractive, and mucilage.

The outer yellow rind of the fruit is a grateful aromatic bitter.

The unripe fruit dried are called Curaçoa oranges. They vary in size from that of a pea to that of a cherry. They are bitterer than the rind of ripe oranges, but not so aromatic, and are used as a stomachic.

Medical use.—The leaves have been celebrated by eminent physicians, as a powerful antispasmodic in convulsive disorders, and especially in epilepsy; with others they have entirely failed. Orange flowers were at one time said to be an useful remedy in convulsive and epileptic cases; but experience has not confirmed the virtues attributed to them. As by drying they lose their virtues, they may be preserved for this purpose, by packing them closely in earthen vessels, with half their weight of muriate of soda. The juice of the fruit is of considerable use in febrile or inflammatory distempers, for allaying heat, quenching thirst, and promoting the salutary excretions: it is likewise of use in genuine scorbutus, or sea-scurvy. Although the Seville, or *bitter orange*, as it is called, has alone a place in our pharmacopœias, yet the China, or sweet orange, is much more employed. Its juice is milder, and less acid; and is very frequently used in its most simple state with great advantage. Dr. Wright applied the roasted pulp as a poultice to fetid sores, in the West Indies, with very great success.

The rind proves an excellent stomachic and carminative, promoting appetite, warming the habit, and strengthening the tone of the viscera. Orange-peel appears to be considerably warmer than that of lemons, and to abound more with essential oil; to this circumstance, therefore, due regard ought to be had in the use of these medicines. The flavour of the first is likewise supposed to be less perishable than that of the other.

Off. prep. of the rind.—Syr. cort. aurantii, *Lond. Dub.* Aq. destil. *Ed.* Spiritus raph. comp. *Lond. Dub.* Tinctura cort. A. *Lond. Dub.* Tinct. cinch. comp. *Lond. Dub.* Tinct. gent. comp. *Ed.* Conserva cort. A. *Ed. Lond. Dub.*

Of the juice.—Succ. coch. comp. *Lond. Ed.*

Sp. CITRUS MEDICA. Ed. Syn. Limon. Lond. Dub.
Lemon tree.

Off.—Fructus, cortex fructûs, et ejus oleum volatile. The juice and outer rind of the fruit, and the volatile oil of the outer rind.

THE juice of lemons is similar in quality to that of oranges, from which it differs little otherwise than in containing more citric acid and less syrup. The quantity of the former is indeed so great, that the acid has been named from this fruit, Acid of Lemons, and is commonly prepared from it. The simple expressed juice will not keep, on account of the syrup, extractive, and mucilage, and quantity of water which it contains, which causes it to ferment.

It was therefore extremely desirable that an easy method should be discovered of reducing it to such a state that it would not spoil by keeping, and would be less bulky.

Various means have been proposed and practised with this view. The juice has been evaporated to the consistence of rob; but this always gives an empyreumatic taste, and does not separate the extractive or mucilage, so that it is still apt to ferment when agitated on board of ship in tropical climates. It has been exposed to frost, and part of the water removed under the form of ice; but this is liable to all the former objections, and besides, where the lemons are produced in sufficient quantity, there is not a sufficient degree of cold. The addition of a quantity of alcohol to the inspissated juice separates the mucilage, but not the extractive or sugar. By means, however, of Scheele's process, as reduced to determinate quantities by Proust, we can obtain the acid perfectly pure and crystallized.

To 94 parts of lemon juice, 4 parts of carbonate of lime are to be added: the carbonic acid is separated by effervescence, and a quantity of insoluble citrate of lime is precipitated. By evaporating the supernatant liquor, another portion of citrate of lime is obtained. These added together amount to about $7\frac{1}{2}$ parts, and require 20 parts of sulphuric acid, of the specific gravity of 1.15, to decompose them. The sulphate of lime, being nearly insoluble, is precipitated, while the citric acid remains in solution, and is to be separated by washing, and crystallized by evaporation. If too much sulphuric acid be added, when the liquor is much concentrated, it reacts upon the citric acid, and chars a portion of it. When this is the case, a little chalk must be added.

By this, or some similar process, it is now manufactured in this country, in large quantities, and sold under the name of Coxwell's Concrete Salt of Lemons.

The yellow peel is an elegant aromatic, and is frequently em-

ployed in stomachic tinctures and infusions: it is considerably less hot than orange peel, and yields in distillation with water a smaller quantity of essential oil: its flavour is nevertheless more perishable, yet does not arise so readily with spirit of wine; for a spiritous extract made from lemon-peel possesses the aromatic taste and smell of the subject in much greater perfection than an extract prepared in the same manner from the peels of oranges.

Citric acid is a powerful and agreeable antiseptic. Its powers are much increased, according to Dr. Wright, by saturating it with muriate of soda. The mixture he recommends as possessing very great efficacy in dysentery, remittent fever, the belly-ach, putrid sore throat, and as being perfectly specific in diabetes and lenteria. Citric acid is often used with great success for allaying vomiting: with this intention it is mixed with carbonate of potash, from which it expels the carbonic acid with effervescence. This mixture should be drunk as soon as it is made; or the carbonic acid gas, on which actually the anti-emetic power of this mixture depends, may be extricated in the stomach itself, by first swallowing the carbonate of potash dissolved in water, and drinking immediately afterwards the citric acid properly sweetened. The doses are about a scruple of the carbonate dissolved in eight or ten drachms of water, and an ounce of lemon juice, or an equivalent quantity of citric acid.

Lemon juice is also an ingredient in many pleasant refrigerant drinks, which are of very great use in allaying febrile heat and thirst. Of these, the most generally useful is lemonade, or diluted lemon-juice, properly sweetened. Lemonade, with the addition of a certain quantity of any good ardent spirit, forms the well-known beverage punch, which is sometimes given as a cordial to the sick. The German writers order it to be made with arrack, as rum and brandy, they say, are apt to occasion headach. But the fact is directly the reverse, for of all spirits, arrack is most apt to produce headach. The lightest and safest spirits are those which contain least essential oil, or other foreign matters, and which have been kept the longest time after their distillation.

Off. prep. of the rind.—Aq. dest. *Ed.* Spt. ammon. comp. *Ed. Lond. Dub.* *Of the juice.*—Syr. citr. med. *Ed. Lond. Dub.* Succ. fissat. *Lond.* *Of the oil.*—Ungt. sulph. *Ed.* Ungt. helleb. alb. *Lond. Dub.*

COCCUS CACTI. *Ed.* *Syn. Coccinella. Lond.*
Cochineal.

COCHINEAL is the dried body of the female of a hemipterous insect. It is found only in Mexico, and is nourished entirely on the leaves of the opuntia or nopal (cactus coccinelliferus). The

wild cochineal, which is covered with a silky envelope, is less valuable than the cultivated cochineal, which is without that covering, but grows to a larger size, and furnishes a finer and more permanent colour. The Spaniards endeavour to confine both the insect and the plant on which it feeds to Mexico. But this attempt at monopoly will, we hope, be frustrated by the exertions of some gentlemen in the East-Indies. The male only is furnished with wings, the female has none, and remains constantly attached to the leaf of the cactus. During winter, the Mexicans preserve these insects, with the succulent leaves to which they are attached, in their houses. In spring, after the rainy season is over, they are transferred to the living plants, and in a few days they lay innumerable eggs, and die. They are collected three times in the year; first, the dead mothers are gathered as soon as they have laid their eggs; in three or four months, the young which have grown to a sufficient size are collected; and in three or four months more, all the young are collected, large and small indiscriminately, except those which they preserve for breeding next year. They are killed by inclosing them in a bag and dipping them in hot water, and by exposing them on iron plates to the heat of the fire. 800,000 pounds are brought annually to Europe; and each pound contains at least 70,000 insects. From their appearance, when brought to us, they were long supposed to be the seed of some plant. They are small, irregular, roundish bodies, of a blackish-red colour on the outside, and a bright purple red within. Their taste is acrid, bitterish, and astringent. They are used chiefly for the sake of the fine colour which they produce, and they are principally consumed by the scarlet dyers. In pharmacy they are employed to give a beautiful red to some tinctures. Their colour is easily extracted, both by alcohol, water, and water of ammonia; and in the dried insect it is not impaired by keeping for any length of time.

Neumann got from 1920 grains 1440 watery extract; and in another experiment, from the same quantity 1430 alcoholic. The former was extremely gelatinous.

Medical use.—They have been lately recommended as an anodyne.

Off. prep.—Tinct. card. comp. *Lond. Dub.* Tinct. arist. serpa. *Ed.* Tinct. cinchon. comp. *Lond.* Tinct. gent. comp. *Ed.* Tinct. helleb. *Ed. Lond. Dub.* Tinct. canth. *Lond.*

COCHLEARIA.

Willd. g. 1228. *Tetradynamia Siliculosa.*—Nat. ord. *Siliquosae*

Sp. 1. COCHLEARIA OFFICINALIS. Ed. Syn. Cochlearia. Dub. Cochlearia hortenſis. Lond.

Green ſcurvy-graſs.

Off.—Herba. The plant.

THIS is an annual plant, which grows on the ſea-ſhore of the northern countries of Europe, and is ſometimes cultivated in gardens. As long as it is freſh it has a peculiar ſmell, eſpecially when bruised, and a kind of ſaline acrid taſte, which it loſes completely by drying, but which it imparts by diſtillation to water or alcohol. It alſo furniſhes an eſſential oil, the ſmell of which is ſo ſtrong as to make the eyes water.

Med. uſe.—The freſh plant is a gentle ſtimulant and diuretic, and is chiefly uſed for the cure of ſea-ſcurvy. It is employed externally as a gargle in ſore throat, and ſcorbutic affections of the gums and mouth. It may be eaten in ſubſtance in any quantity, or the juice may be expreſſed from it, or it may be infuſed in wine or water, or its virtues may be extracted by diſtillation.

Off. prep.—Succus coch. comp. *Lond. Ed. Spirit raph. comp. Lond. Dub.*

Sp. 3. COCHLEARIA ARMORACIA. Ed. Syn. Raphanus ruſſi- canus. Lond. Dub.

Horſe-radish.

Off.—Radix. The root.

THIS perennial plant is ſometimes found wild about river ſides, and other moiſt places: for medicinal and culinary uſes, it is cultivated in gardens. It flowers in June, but rarely perfects its ſeeds in this country. Horſe-radish root has a quick pungent ſmell, and a penetrating acrid taſte; it nevertheless contains in certain veſſels a ſweet juice, which ſometimes exudes upon the ſurface. Both water and alcohol extract its virtues by infuſion. By drying, it loſes all its acrimony, becoming firſt ſweetiſh, and afterwards almoſt inſipid: if kept in a cool place, covered with ſand, it retains its qualities for a conſiderable time.

3840 parts, according to Neumann, were reduced by drying to 1000, and gave of watery extract 480, and 15 of alcoholic, and inverſely, 420 alcoholic, and 480 watery; all theſe extracts were ſweetiſh, without pungency. About 15 of volatile oil, extremely pungent, and heavier than water, aroſe in diſtillation with water.

Medical uſe.—This root is an extremely penetrating ſtimulus. It excites the ſolids, and promotes the fluid ſecretions; it ſeems to extend its action through the whole habit, and affects the minuteſt glands. It has frequently been of ſervice in ſome kinds of ſcurvies and other chronic diſorders, ſuppoſed to proceed from a viſciduity of the juices, or obſtructions of the excretory ducts. Sydenham

recommends it likewise in dropfies, particularly thofe wh ch sometimes follow intermittent fevers.

Off. prep.—*Spirit. raph. comp. Lond. Dub.*

COCOS BUTYRACEA. *Syn. Palma. Ed.*

Palma.—*Nat. ord. Palma.*

The mackaw tree.

Off.—*Nucis oleum fixum.* The fixed oil of the nut, commonly called Palm oil.

THIS tree is a native of South America. The fruit is triangular, yellow, and as big as a plumb. The nut or kernel yields the oleum palmæ of the fops. It is firft flightly roasted and cleaned, and then ground to a pafte, firft in a mill, then on levigating ftone. This pafte is gently heated, and mixed with $\frac{1}{8}$ its weight of boiling water put into a bag, and the oil expreffed between two heated plates of iron. It yields $\frac{7}{8}$ or $\frac{8}{8}$ of oil. If coloured, this oil may be purified by filtration when melted. It then has the confiftence of butter, a golden yellow colour, the fmell of violets, and a fweetifh tafte. When well-preferved, it keeps feveral years without becoming rancid. When fpoiled, it lofes its yellow colour and pleafant fmell. It is faid to be often imitated with axunge, coloured with turmeric, and fcented with Florentine iris root. It is rarely ufed in medicine, and only externally as an emollient ointment.

COLCHICUM AUTUMNALE. *Ed. Syn. Colchicum. Lond. Dub.*

Willd. g. 707, fp. 1. Hexandria Trigynia.—*Nat. ord. Liliaceæ.*

Meadow faffron.

Off.—*Radix.* The root.

MEADOW SAFFRON is a perennial bulbous-rooted plant, which grows in wet meadows in the temperate countries of Europe. It flowers in the beginning of autumn, at which time the old bulb begins to decay, and a new bulb to be formed. In the following May the new bulb is perfected, and the old one wafed and corrugated. They are dug for medical ufe in the beginning of fummer. The fenfible qualities of the frefh root are very various: according to the place of growth, and feafon of the year. In autumn it is inert; in the beginning of fummer, highly acrid: fome have found it to be a corrofive poifon; others have eaten it in confiderable quantity without experiencing any effect. When it is poffeffed of acrimony, this is of the fame nature with that of garlic and is entirely deftroyed by drying.

Medical use.—Störk, Collin, and Plenck, have celebrated its virtues as a diuretic in hydrothorax and other dropsies. But it is at best a very uncertain remedy. The expressed juice is used in Alsace to destroy vermin in the hair.

Off. prep.—Syr. colch. autumn. *Ed.* Oxymel colchici, *Lond.*

COLOMBA. *Lond. Ed. Columbo. Dub.*

Colomba.

Off.—Radix. The root.

THIS is the root of an unknown plant, which, however, is conjectured by Willdenow to be a species of bryonia. It was supposed to have its name from a city in Ceylon, from which it is sent over all India. But more recent accounts say, that it is produced in Africa, in the country of the Caffres, and that it forms an important article of commerce with the Portuguese at Mozambique, in the province of Tranquebar. It is generally brought in transverse sections, from half an inch to three inches in diameter, rarely divided horizontally. This is evidently done to facilitate its drying, for the large pieces are all perforated with holes. The bark is wrinkled and thick, of a dark brown colour on the outside, and bright yellow within. The pith in the centre is spongy, yellowish, and slightly striped. Its smell is slightly aromatic, and readily lost when not preserved in close vessels; its taste is unpleasant, bitter, and somewhat acrid; the bark has the strongest taste; the pith is almost mucilaginous. Its essential constituents are cinchonin, and a great deal of mucilage. It is accordingly more soluble in water than in alcohol. The tincture is not precipitated by water, and does not affect the colour of infusion of turnsole, or solution of red sulphate of iron.

Med. use.—In India it is much used in diseases attended with bilious symptoms, particularly in cholera; and it is said to be sometimes very effectual in other cases of vomiting. It often produces excellent effects in dyspepsia. Half a drachm of the powder is given repeatedly in the day.

Off. prep.—Tinct. *Ed. Lond. Dub.*

CONIUM MACULATUM. *Ed. Syn. Cicuta. Lond. Dub.*

Willd. g. 533, sp. 1. Pentandria Digynia.—*Nat. ord. Umbellata.*

Hemlock.

Off.—Folium, semen, flos. The leaf, flower, and seed.

THIS is a large biennial umbelliferous plant, which grows very commonly about the sides of fields, under hedges, and in moist shady places. As it may easily be confounded with other plants of the same natural order, which are either more virulent, or less

active, we shall give a full description of its botanical characters. The root is white, long, of the thickness of a finger, contains, when it is young, a milky juice, and resembles both in size and form the carrot. In spring it is very poisonous, in harvest less so. The stalk is often three, four, and even six feet high, hollow, smooth, not beset with hairs, and marked with red or brown spots. The leaves are large, and have long and thick foot-stalks, which, at the lower end, assume the form of a groove, and surround the stem. From each side of the foot-stalk other foot-stalks arise, and from these a still smaller order, on which there are sessile, dark-green, shining, lancet-shaped, notched leaflets. The umbels are terminal and compound. The flowers consist of five white heart-shaped leaves. The seeds are flat on the one side, and hemispherical on the other, with five serrated ribs. This last circumstance, with the spots on the stalks, and the peculiar very nauseous smell of the plant, somewhat resembling the urine of a cat, serve to distinguish it from all other plants. We must not be misled by its officinal name *Cicuta*, to confound it with the *Cicuta virosa* of Linnæus, which is one of the most virulent plants produced in this country, and readily distinguishable from the conium, by having its roots always immersed in water, which those of the conium never are. The possibility of this mistake shews the propriety of denominating all vegetables by their systematic names, as the Edinburgh college now do. The other plants which have been mistaken for the conium maculatum are the *æthusa cynapium*, *caucalis anthriscus*, and several species of *chærophylloides*, especially the *bulbosum*, which, however, is not native of this country.

Hemlock should not be gathered unless its peculiar smell be strong. The leaves should be collected in the month of June, when the plant is in flower. The leaflets are to be picked off, and the foot-stalks thrown away. The leaflets are then to be dried quickly in a hot sun, or rather on tin plates before a fire, and preserved in bags of strong brown paper, or powdered and kept in close vessels, excluded from the light; for the light soon dissipates their green colour, and with it the virtues of the medicine.

Med. use.—Fresh hemlock contains not only the narcotic, but also the acrid principle; of the latter much, and of the former little, is lost by drying. The whole plant is a virulent poison, but varying very much in strength, according to circumstance. When taken in an over-dose, it produces vertigo, dimness of sight, difficulty of speech, nausea, putrid eructations, anxiety, tremors, and paralysis of the limbs. But Dr. Störk found, that in small doses it may be taken with great safety; and that, without at all disordering the constitution, or even producing any sensible operation, it sometimes proves a powerful remedy in man.

obstinate disorders. In scirrhus, the internal and external use of hemlock has been found useful, but then mercury has been generally used at the same time. In open cancer it often abates the pain, and is free from the constipating effects of opium. It is likewise used in scrofulous tumours and ulcers, and in other ulcers that are only defined by the term ill-conditioned. It is also recommended by some in chincough, and various other diseases. Its most common, and best form, is that of the powdered leaves, in the dose at first of two or three grains a-day, which in some cases has been gradually increased to upwards of two ounces a-day, without producing giddiness. An extract from the seeds is said to produce giddiness sooner than that from the leaves.

Off. prep.—Succ. spissat. con. maculat. *Ed. Lond. Dub.*

CONVOLVULUS.

Willd. g. 323. *Pentandria Monogynia*.—*Nat. ord Campanaceæ.*

Sp. 4. CONVULVULUS SCAMMONIA. *Ed. Syn. Scammonium.*

Lond. Dub.

Scammony.

Off.—Gummi-resina. The gum-resin.

THE scammony convolvulus is a climbing perennial plant, which grows in Syria, Mysia, and Cappadocia. The roots, which are very long and thick, when fresh contain a milky juice. To obtain this, the earth is removed from the upper part of the roots, and the tops of these are cut obliquely off. The milky juice which flows out, is collected in a small vessel sunk in the earth at the lower end of the cut. Each root furnishes only a few drachms, but it is collected from several vessels, and dried in the sun. This is the true and unadulterated scammony. It is light, of a dark grey colour, but becomes of a whitish yellow when touched with the wet finger, is shining in its fracture, has a peculiar nauseous smell, and bitter acrid taste, and forms with water a greenish milky fluid, without any remarkable sediment. In this state of purity it seldom reaches us, but is commonly mixed with the expressed juice of the root, and even of the stalks and leaves, and often with flour, sand, or earth. The best to be met with in the shops comes from Aleppo, in light spongy masses, having a heavy disagreeable smell, friable, and easily powdered, of a shining ash colour verging to black; when powdered, of a light grey or whitish colour. An inferior sort is brought from Smyrna in more compact ponderous pieces, with less smell, not so friable, and less easily powdered, of a darker colour, not so resinous, and full of sand and other impurities.

Resin is the principal constituent of scammony. Sixteen

ounces of good Aleppo scammony, give eleven ounces of resin, and three and a half of watery extract.

Medical use.—Scammony is an efficacious and strong purgative. Some have condemned it as unsafe, and laid various ill qualities to its charge; the principal of which is, that its operation is uncertain, a full dose proving sometimes ineffectual, whilst at others a much smaller one occasions dangerous hypercatharsis. This difference, however, is owing entirely to the different circumstances of the patient, and not to any ill quality, or irregularity of operation, of the medicine: where the intestines are lined with an excessive load of mucus, the scammony passes through without exerting itself upon them; where the natural mucus is deficient, a small dose of this or any other resinous cathartic, irritates and inflames. Many have endeavoured to diminish the activity of this drug, and to correct its imaginary virulence, by exposing it to the fumes of sulphur, dissolving it in acids, and the like; but these only destroy a part of the medicine without making any alteration in the rest. Scammony in substance, judiciously managed, stands not in need of any corrector: if triturated with sugar, or with almonds, it becomes sufficiently safe and mild in its operation. It may likewise be conveniently dissolved, by trituration, in a strong decoction of liquorice, and the solution then poured off from the feces. The common dose of scammony is from three to twelve grains.

Off. prep.—Elect. scammon. *Lond. Dub.* Pulv. comp. *Lond. Ed. Dub.* Pulv. scam. cum aloe, *Lond.* Pulv. scam. cum calom. *Lond.* Extract. coloc. comp. *Lond.* Pulv. sen. comp. *Lond.* Pil. aloes cum coloc. *Ed.*

Sp. 61. CONVULVULUS JALAPA. Ed. Syn. Jalapium. Lond. Jalapa. Dub.

Jalap.

Off.—Radix. The root.

JALAP is another climbing perennial species of convolvulus. It is an inhabitant of Mexico and Vera Cruz. It is brought to us in thin transverse slices, which are covered with a blackish wrinkled bark, and are of a dark grey colour internally, marked with darker or blackish stripes. It has a nauseous smell and taste, and when swallowed it affects the throat with a sense of heat, and occasions a plentiful discharge of saliva. When powdered it has a yellowish grey colour.

Such pieces should be chosen as are most compact, hard, weighty, dark coloured, and abound most with black circular striæ and shining points: the light, whitish, friable worm-eaten pieces must be rejected.

Slices of bryony root are said to be sometimes mixed with those of jalap: but these may be easily distinguished, by their whiter colour, and less compact texture.

Neumann got from 7680 parts, 2480 alcoholic, and then by water 1200; and inversely, 2160 watery, besides 360, which precipitated during the evaporation, and 1440 alcoholic: the tincture extracted from 7680 parts, when precipitated by water, gave 1920.

Medical use.—Jalap in substance, taken in a dose of about half a drachm (less or more, according to the circumstances of the patient), in plethoric, or cold phlegmatic habits, proves an effectual, and in general a safe purgative, performing its office mildly, seldom occasioning nausea or gripes, which too frequently accompany the other strong cathartics. In hypochondriacal disorders, and hot bilious temperaments, it gripes violently, if the jalap be good; but rarely takes due effect as a purge. An extract originally made by water purges almost universally, but weakly; and at the same time has a considerable effect by urine: what remains after this process gripes violently. The pure resin, prepared by alcohol, occasions most violent gripings, and other distressing symptoms, but scarcely proves at all cathartic: triturated with sugar, or with almonds, into the form of an emulsion, or dissolved in spirit, and mixed with syrups, it purges plentifully in a small dose, without occasioning much disorder: the part of the jalap remaining after the separation of the resin, yields to water an extract, which has no effect as a cathartic, but operates powerfully by urine.

Off. prep.—Tinct. *Ed. Lond. Dub.* Extract, *Ed. Lond. Dub.* Pulv. comp. *Ed.* Tinct. fennæ comp. *Ed.*

COPAIFERA OFFICINALIS.

Willd. g. 880, sp. 1. Decandria Monogynia.—Nat. ord. *Dumosa.*

Copaiva tree.

Off.—Resina liquida, *Ed.* Balsamum copaiva, *Lond.* Balsamum copaiba, *Dub.* The resin. Balsam of copaiva.

THE tree which produces this resin is a native of the Spanish West-India islands, and of some parts of the continent of South America. It grows to a large size, and the resinous juice flows in considerable quantities from incisions made in the trunk.

The juice is clear and transparent, of a whitish or pale yellowish colour, an agreeable smell, and a bitterish pungent taste. It is usually about the consistence of oil, or a little thicker; when long kept, it becomes nearly as thick as honey, retaining its clearness; but has not been observed to grow dry or solid, as most of the other resinous juices do. The best resin of copaiva comes from Brazil; but we sometimes meet with a thick sort, which is

not at all transparent, or much less so than the foregoing, and generally has a portion of turbid watery liquor at the bottom. This is probably either adulterated by the mixture of other substances, or has been extracted by decoction from the bark and branches of the tree: its smell and taste are much less pleasant than those of the genuine resin.

Pure resin of copaiva dissolves entirely in alcohol: the solution has a very fragrant smell. Distilled with water it yields a large quantity of a limpid essential oil, but no benzoic acid: it is therefore not a balsam, but a combination of resin and volatile oil. Neumann says that it effervesces with liquid ammonia.

Med. use.—The resin of copaiva is an useful corroborating detergent medicine, but in some degree irritating. It strengthens the nervous system, tends to loosen the belly; in large doses proves purgative, promotes urine, and cleans and heals exulcerations in the urinary passages, which it is supposed to perform more effectually than any of the other resinous fluids. Fuller observes, that it gives the urine an intensely bitter taste, but not a violet smell, as the turpentine do.

This resin has been principally celebrated in gleet, and the fluor albus, and externally as a vulnerary.

The dose of this medicine rarely exceeds 20 or 30 drops, though some authors direct 60, or upwards. It may be conveniently taken in the form of an oleosaccharum, or in that of an emulsion, into which it may be reduced, by triturating it with almonds, with a thick mucilage of gum-arabic, or with the yolk of eggs, till they are well incorporated, and then gradually adding a proper quantity of water.

CORIANDRUM SATIVUM. *Ed. Coriandrum. Lond. Dub. Willd. g. 552, sp. 1. Pentandria Digynia.*—Nat. ord. *Umbellata*. Coriander.

Off.—Semen. The seeds.

CORIANDER is an annual, umbelliferous plant, a native of the south of Europe, differing from all the others of that class, in producing *spherical* seeds. These, when fresh, have a strong disagreeable smell, which improves by drying, and becomes sufficiently grateful. They are recommended as carminative and stomachic.

Off. prep.—Infus. fennæ tart. *Lond.* Inf. tamarindi cum sen-na, *Ed.* Tinct. sen. comp. *Ed.* Elect. fennæ, *Ed. Lond.*

CROCUS SATIVUS. *Ed. Crocus. Lond. Dub.*

Willd. g. 92, sp. 1. Triandria Monogynia.—Nat. ord. *Liliacea*. Common saffron.

Off.—Floris stigma, *Crocus dictum*. The summits of the pistils, called Saffron.

CROCUS is a bulbous-rooted perennial plant, probably a native of the East, although it is now found wild in England, and other temperate countries of Europe. It is very generally cultivated as an ornament to our gardens, and in some places for the saffron, which is formed of the dried summits of the pistil, and not of the filaments, as stated by the Dublin college. Each flower has one pistil, the summit of which is deeply divided into three slips, which are of a dark orange-red colour, verging to white at the base, and are smooth and shining. Their smell is pleasant and aromatic, but narcotic; their taste a fine aromatic bitter, and they immediately give a deep yellow colour to the saliva when chewed. The flowers are gathered early in the morning, just before they open; the summits of the pistils are picked out, very carefully dried by the heat of a stove, and compressed into firm cakes. In this island the English saffron is superior to what is imported from other countries, and may be distinguished by its blades being broader.

On the continent they reckon the Austrian and the French from Gatinois the best. The Spanish is rendered useless, by being dipt in oil, with the intention of preserving it. Saffron should be chosen fresh, not above a year old, in close cakes, neither dry, nor yet very moist; tough and firm in tearing; difficultly pulverizable; of a fiery, orange-red colour; of the same colour within as without; of a strong, acrid, diffusive smell; and capable of colouring a very large proportion of water or alcohol. Saffron which does not colour the fingers when rubbed between them, or stains them with oil, has little smell or taste, or a musty or foreign flavour, is too tender, and has a whitish, yellow, or blackish colour, is bad. It is said that it is sometimes adulterated with the fibres of smoked beef, and with the flowers of the *carthamus tinctorius*, *calendula officinalis*, &c. The imposition may be detected by the absence of the white ends, which may be observed in the real saffron, by the inferior colouring power, and by the want of smell, or bad smell when thrown on live coals.

By distillation with water, saffron furnishes a small proportion of essential oil, of a golden yellow colour, heavier than water, and possessing the characteristic smell in an eminent degree. According to Hermbstaedt, the soluble matter of saffron is extractive nearly pure. Neumann obtained from 480 dried saffron 360 grains of watery extract which was soluble in alcohol, except 24 of a colourless matter like sand, and afterwards 20 of alcoholic; and inversely, 320 of alcoholic extract entirely soluble in water, and then 90 of watery.

On account of the great volatility of the aromatic part of the saffron, it should be wrapt up in bladder, and preserved in a box or tin case.

an aromatic flavour, not of the most agreeable kind, residing in a volatile oil.

Off. prep.—Cataplasma cum. *Lond.* Emplastr. cum. *Lond.*

CUPRUM. *Lond. Dub. Ed.*

Copper.

COPPER is found in many countries.

a. In its metallic state :

1. Crystallized.
2. Alloyed with arsenic and iron.
3. Sulphuretted.

b. Oxidized :

4. Uncombined.
5. Combined with carbonic acid.
6. ————— sulphuric acid.
7. ————— arsenic acid.

The general properties of copper have been already enumerated.

Copper has a more perceptible smell and taste than almost any other metal. Its effects when taken into the stomach are highly deleterious, and often fatal. It particularly affects the primæ viæ, exciting excessive nausea, vomiting, colic pains, and purging, sometimes of blood, or, though more rarely, obstinate constipation. It also produces agitation of the mind, headach, vertigo, delirium ; renders the pulse small and weak, the countenance pale, and causes fainting, convulsions, paralysis, and apoplexy. When any of these symptoms occur, we must endeavour to obviate the action of the poison by large and copious draughts of oily and mucilaginous liquors, or to destroy its virulence by solutions of potass, or sulphuret of potass.

Poisoning from copper is most commonly the effect of ignorance, accident, or carelessness ; and too many examples are met with of fatal consequences ensuing upon eating food which had been dressed in copper vessels not well cleaned from the rust which they had contracted by lying in the air ; or pickles, to which a beautiful green colour had been given, according to the murderous directions of the most popular cookery books, by boiling them with halfpence, or allowing them to stand in a brass pan until a sufficient quantity of verdegriis was formed.

Great care ought to be taken that acid liquors, or even water, designed for internal use, be not suffered to stand long in vessels made of copper, otherwise they will dissolve so much of the metal

as will give them dangerous properties. But the sure preventive of these accidents is to banish copper utensils from the kitchen and laboratory. The presence of copper in any suspected liquor is easily detected by inserting into it a piece of polished steel, which will soon be coated with copper, or by dropping into it some carbonate of ammonia, which will produce a beautiful blue colour if any copper be present.

But although copper be thus dangerous, some preparations of it are in certain cases used with great advantage both externally and internally.

The chief of these are,

1. The sub-acetate of copper.
2. The sulphate of copper.
3. The sub-sulphate of copper and ammonia.
4. The muriate of copper and ammonia.
5. A solution of the sulphate of copper, and super-sulphate of alumina in sulphuric acid.

As the two first of these are never prepared by the apothecary, but bought by him from the manufacturer, they are inserted in the list of materia medica.

SUB-ACETIS CUPRI. *Ed. Ærugo. Lond. Dub.*

Sub-acetate of Copper. Verdegris.

THE preparation of this substance was almost confined to Montpellier in France, owing chiefly to an excellent regulation which existed, that no verdegris could be sold until it had been examined and found of sufficiently good quality. For since that regulation has been abolished, Chaptal informs us, that so many abuses have crept into the manufacture, that the Montpellier verdegris has lost its decided superiority of character. It is prepared by stratifying copper plates with the husks and stalks of the grape, which have been made to ferment after the wine has been expressed from them. In from ten to twenty days, when the husks become white, the plates of copper are taken out, and their surfaces are found to be covered with detached and silky crystals. They are now placed on edge, with their surfaces in contact, in the corner of a cellar, and alternately dipt in water, and replaced to dry every seven or eight days, for six or eight times. By this management, the plates swell, and are everywhere covered with a coat of verdegris, which is easily separated with a knife. In this state it is only a paste, and is sold by the manufacturers to commissioners, who beat it well with wooden mallets, and pack it

up in bags of white leather, a foot high and ten inches wide, in which it is dried by exposing it to the air and sun, until the loaf of verdegriis cannot be pierced with the point of a knife.

Sub-acetate of copper should be of a bluish-green colour, dry and difficult to break, and should neither deliquesce, have a salt taste, contain any black or white spots, nor be adulterated with earth or gypsum. Its purity may be tried by diluted sulphuric acid, in which the sub-acetate dissolves entirely, and the impurities remain behind.

Verdegriis, as it comes to us, is generally mingled with stalks of the grape; they may be separated, in pulverization, by discontinuing the operation as soon as what remains seems to be almost entirely composed of them.

Medical use.—Verdegriis is never or rarely used internally. Some writers highly extol it as an emetic, and say, that a grain or two act as soon as received into the stomach; but its use has been too often followed by dangerous consequences to allow of its employment. Verdegriis applied externally, proves a gentle detergent and escharotic, and is employed to destroy callous edges, or fungous flesh in wounds. It is also advantageously applied to scorbutic ulcers of the mouth, tongue, or fauces, and deserves to be carefully tried in cancerous sores. With these intentions it is an ingredient in different officinal compositions.

Off. prep.—Oxymel aeruginis, *Lond.* Acid acetos. *Lond.* Aerug. ppt. *Lond.* Ungt. sub-acet. cupri, *Ed.* Empl. mel. ves. comp. *Ed.*

SULPHAS CUPRI. *Ed.* Cuprum vitriolatum. *Dub.* Vitriolatum caeruleum. *Lond.*

Sulphate of copper. Blue vitriol.

THIS metallic salt is rarely formed by combining directly its component parts; but it is obtained, either by evaporating mineral waters which contain it, or by acidifying native sulphuretted copper, by exposing it to the action of air and moisture, or by burning its sulphur.

When pure it has a deep blue colour, and is crystallized generally in long rhomboids. It effloresces slightly in the air, is soluble in four parts of water at 60°, and in two at 212°, and is insoluble in alcohol. By heat it loses, first its water of crystallization, and afterwards all its acid. It is decomposed by the alkalies and earths, and some of the metals, the alkaline carbonates, borates, and phosphates, and some metallic salts.

It is composed of,

Copper,	24	}	42 hydro-oxide of copper.
Oxygen,	8		
Water,	10		
			33 sulphuric acid.
			25 water of crystallization.

100

The sulphate of copper has a strong, styptic, metallic taste, and is chiefly used externally as an escharotic for destroying warts, callous edges, and fungous excrescences, as a stimulant application to ill-conditioned ulcers, and as a styptic to bleeding surfaces. Taken internally, it operates, in very small doses, as a very powerful emetic. It has, however, been exhibited in incipient phthisis pulmonalis, intermittent fever, and epilepsy, but its use is not free from danger.

Off. prep.—Solutio sulphatis cupri composita, *Ed.* Ammoniaretum cupri, *Ed. Lond. Dub.*

CURCUMA LONGA. *Curcuma. Lond.*

Willd. g. 11, sp. 2. Monandria Monogynia.—Nat. ord. *Scitamineæ*.
Turmeric.

Off.—Radix. The root.

TURMERIC is a perennial plant, a native of the East Indies. The roots are tuberous, knotty, and long, wrinkled, externally of a pale yellow colour, and internally of a shining saffron brown. They have a weak aromatic smell, and a slightly bitter aromatic taste. They contain a very little essential oil; and Neumann got from 960 parts, 320 watery, and afterwards 50 alcoholic extract, and inversely 150 alcoholic, and 210 watery.

Medical use.—Turmeric, when taken internally, tinges the urine of a deep yellow colour, and acts as a gentle stimulant. It has been celebrated in diseases of the liver, jaundice, cachexy, dropsy, intermittent fevers, &c. But its internal use in this country is almost confined to its being a principal ingredient in the composition of curry powder, in which form it is used in immense quantities in the East Indies. It is also a valuable dye-stuff, and an excellent chemical test of the presence of uncombined alkalies; for the yellow colour of turmeric is changed by them to a reddish brown.

CYNARA SCOLYMUS *Ed. Cynara. Lond. Cynara Her- tensis. Dub.*

Willd. g. 1436, sp. 2. Syngenesia Polygamia æqualis.—Nat. ord. *Compositæ capitatæ*

Artichoke.

Off.—Folium. The leaves.

THE artichoke is a perennial plant, indigenous in the south of Europe, but very frequently cultivated in our gardens for culinary purposes.

The leaves are bitter, and afford by expression a considerable quantity of juice, which is said to be diuretic, and to have been successfully used in dropsy.

DAPHNE MEZEREUM. *Ed. Mezereum. Lond. Mezereum. Dub.*

Willd. g. 773, sp. 1. Oelandria Monogynia—Nat. ord.—Vepreculæ.
Mezereon, or spurge laurel.

Off.—Radix, ejusque cortex. The bark of the root.

MEZEREON is a shrub which grows in woody situations in the northern parts of Europe, and is admitted into our gardens from its flowering in winter. The bark, which is taken from the trunk, larger branches, and root, is thin, striped reddish, commonly covered with a brown cuticle, has no smell, and when chewed, excites an insupportable sensation of burning in the mouth and throat. When applied to the skin in its recent state, or infused in vinegar, it raises blisters.

Medical use.—The root was long used in the Lisbon diet-drink for venereal complaints, particularly nodes and other symptoms resisting the use of mercury. The bark of the root contains most acrimony, though some prefer the woody part. Mezereon has also been used with good effects in tumours and cutaneous eruptions not venereal.

Dr. Cullen says that it acts upon the urine, sometimes giving it a filamentous appearance, and upon the perspiration, without diminishing the strength remarkably; and that in irritable habits it quickens the pulse, and increases the heat of the whole body. But Mr. Pearson of the Lock hospital says, that excepting a case or two of lepra, in which a decoction of this plant conferred temporary benefit, he very seldom found it possessed of medicinal virtues, either in syphilis, or in the sequelæ of that disease. In scrofula, or in cutaneous affections, it is employed chiefly under the form of decoction; but it has also been used in powder; and as it is apt to occasion vomiting and purging, it must be begun in grain-doses, and gradually increased. It is often combined with mercury.

The berries are still more acrid than the bark, and they have even been known to produce fatal effects on children, who have been tempted by their beauty to eat them. It is said that they are sometimes infused in vinegar, to make it more pungent, and appear stronger.

Off. prep.—Decoct. *Ed.* Decoct. sars. comp. *Lond. Dub.*

DATURA STRAMONIUM. *Ed. Stramonium officinale.*
Willd. g. 377, sp. 1. Pentandria Monogynia.—*Nat. ord. Solanaceæ.*
 Thorn-apple.

Off.—Herba. The plant.

THE thorn-apple is an annual plant, a native of America, but now growing wild on dry hills and uncultivated places in England and other parts of Europe. The leaves are dark green, sessile, large, egg-shaped, pointed, angular, and deeply indented, of a disagreeable smell and nauseous taste. Every part of the plant is a strong narcotic poison, producing vertigo, torpor, death. The best antidote to its effects is said to be vinegar.

Medical use.—Dr. Störk first tried it as a remedy in mania and melancholy with considerable success. Several cases of the same diseases were also cured or relieved by it, under the direction of different Swedish physicians; and although in other experiments it frequently failed, it deserves the attention of practitioners, and well merits a trial, in affections often incurable by other means. It has also been employed, and sometimes with advantage, in epilepsy. An ointment prepared from the leaves has been said to give ease in external inflammations and hæmorrhoids. The inspissated juice of the leaves has been commonly used, but its exhibition requires the greatest caution. At first, one fourth of a grain is a sufficient dose. The powder of the leaves or seeds promises to furnish a more uniform and convenient formula than the inspissated juice; and the bruised leaves, according to Plenck, soften hard and inflamed tumours, and discuss tumours in the breasts of nurses from indurated milk.

Hufeland gave it in the form of a tincture, prepared of two ounces of the seeds in four ounces of wine and one of diluted alcohol, in diseases of the mind.

DAUCUS CAROTA. *Semen. Ed. Daucus sylvestris. Lond. Dub.*

Willd. g. 530, sp. 1. Pentandria Digynia.—*Nat. ord. Umbellatæ.*
 Wild Carrot.

Off.—Semen. The seed.

THIS is a biennial plant, which grows wild in Britain, and is cultivated in great quantities as an article of food. The seeds, especially of the wild variety, have a moderately warm pungent taste, and an agreeable aromatic smell. They are carminative, and are said to be diuretic. The roots, especially of the cultivated variety, contain much mucilaginous and saccharine matter, and are therefore highly nutritious and emollient. When beaten to a pulp, they form an excellent application to carcinomatous and ill-conditioned ulcers, allaying the pain, checking the suppuration and fetid smell, and softening the callous edges.

DELPHINIUM STAPHISAGRIA. *Staphisagria. Lond.**Dub.**Willd. g. 1061, sp. 13. Polyandria Trigynia.*—Nat. ord. *Multiflora.*

Stavesacre.

Off.—Semen. The seed.

STAVESACRE is a biennial plant, a native of the south of Europe. The seeds are usually brought from Italy. They are large and rough, of an irregular triangular figure, of a blackish colour on the outside, and yellowish or whitish within; they have a disagreeable smell, and a very nauseous, bitterish, burning taste.

Newmann got from 480 parts, 45 alcoholic extract, besides 90 of fixed oil, which separated during the process, and afterwards 44 insipid watery, and inversely 95 watery, and then by alcohol only one, besides 71 of oil.

Medical use.—Stavesacre was employed by the ancients as a cathartic; but it operates with so much violence, both upwards and downwards, that its internal use has been, among the generality of practitioners, for some time laid aside. It is chiefly employed in external applications for some kinds of cutaneous eruptions, and for destroying lice and other insects; inasmuch, that from this virtue it has received its name, in different languages.

DIANTHUS CARYOPHYLLUS. *Ed. Caryophyllum rubrum. Lond. Dub.**Willd. g. 893, sp. 9. Decandria Digynia.*—Nat. ord. *Caryophyllea.*

Clove Gilly-flower.

Off.—Flos. The flowers.

THIS species of dianthus is a native of Italy, and is perennial. By cultivation, its varieties have increased to a very great number, and they form one of the greatest ornaments of our gardens. Most of these are termed Carnations; but the variety which is officinal surpasses all the others in the richness of its smell, and is also distinguished by its colour, being of an uniform deep crimson. Their only use in pharmacy is to give a pleasant flavour and beautiful colour to an officinal syrup.

Off. prep.—Syr. dianthi caryophyll. *Ed. Lond.*DIGITALIS PURPUREA. *Ed. Digitalis. Lond. Dub.**Willd. g. 1155, sp. 1. Didynamia Angiospermia.*—Nat. ord. *Scrophulariaceæ.*

Foxglove.

Off.—Folium. The leaves.

THIS is an indigenous biennial plant, very common on hedgebanks, and sides of hills, in dry, gravelly, or sandy soils, and the

beauty of its appearance has gained it a place in our gardens and shrubberies. The leaves are large, oblong, egg-shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony.

Medical use.—Its effects when swallowed are,

1. To diminish the frequency of the pulse.
2. To diminish the irritability of the system.
3. To increase the action of the absorbents.
4. To increase the discharge by urine.

In excessive doses, it produces vomiting, purging, dimness of sight, vertigo, delirium, hiccough, convulsions, collapse, death. For these symptoms the best remedies are cordials and stimulants.

Internally, digitalis has been recommended,

1. In inflammatory diseases, from its very remarkable power of diminishing the velocity of the circulation.
2. In active hæmorrhages, in phthisis.
3. In some spasmodic affections, as in spasmodic asthma, palpitation, &c.
4. In mania from effusion on the brain.
5. In anasarca and dropical effusions.
6. In scrofulous tumours.
7. In aneurism of the aorta, and palpitation, we have seen it alleviate the most distressing symptoms.

Externally, it has been applied to scrofulous tumours.

It may be exhibited,

1. In substance, either by itself, or conjoined with some aromatic, or made into pills with soap or gum ammoniac. Withering directs the leaves to be gathered after the flowering stem has shot up, and about the time when the blossoms are coming forth. He rejects the leaf-stalk, and middle rib of the leaves, and dries the remaining part either in the sunshine or before the fire. In this state they are easily reduced to a beautiful green powder, of which we may give at first one grain twice a-day, and gradually increase the dose until it act upon the kidneys, stomach, pulse, and bowels, when its use must be laid aside or suspended.

2. In infusion. The same author directs a drachm of the dried leaves to be infused for four hours in eight ounces of boiling water, and an ounce of any spiritous water to be added to the strained liquor, for its preservation. Half an ounce or an ounce of this infusion may be given twice a-day.

3. In decoction. Darwin directs that four ounces of the fresh leaves be boiled from two pounds of water to one, and that half an

ounce of the strained decoction be taken every two hours, for four or more doses.

4. In tincture. Put one ounce of the dried leaves coarsely powdered into four ounces of diluted alcohol; let the mixture stand by the fire-side twenty-four hours, frequently shaking the bottle; and the saturated tincture, as Darwin calls it, must then be separated from the residuum by straining or decantation. Twenty drops of this tincture may be taken twice or thrice a-day. The Edinburgh college use eight ounces of diluted alcohol to one of the powder, but let it digest seven days.

5. The expressed juice and extract are not proper forms of exhibiting this very active remedy.

When the digitalis is disposed to excite looseness, opium may be advantageously conjoined with it; and when the bowels are tardy, jalap may be given at the same time, without interfering with its diuretic effects. During its operation in this way, the patient should drink very freely.

Off. prep.—Inf. digit. *Ed.* Tinct. digit. *Ed.*

DOLICHOS PRURIENS. *Ed.* *Dolichos.* *Dub.*

Diadelphica Decandria.—Nat. ord. *Papilionaceæ.*

Cow-itch.

Off.—Pubes leguminis rigida. The stiff hairs which cover the pods.

THE dolichos is a climbing plant growing in great abundance in warm climates, particularly in the West Indies. The pods are about four inches long, round, and as thick as a man's finger. On the outside they are thickly beset with stiff brown hairs, which when applied to the skin, occasion a most intolerable itching.

Med. use.—The ripe pods are dipped in syrup, which is again scraped off with the knife. When the syrup is rendered by the hairs as thick as honey, it is fit for use. It acts mechanically as an anthelmintic, occasions no uneasiness in the primæ viæ, which are defended by mucus, and may be safely taken, from a tea-spoonful to a table-spoonful in the morning, fasting. The worms are said to appear with the second or third dose; and by means of a purge in some cases, the stools have consisted entirely of worms.

DORSTENIA CONTRAJERVA. *Ed.* *Contrayerva.* *Lond.* *Dub.*

Willd. g. 244, sp. 5. Tetrandria Monogynia.—Nat. ord. *Scabridæ* *Contrayerva.*

Off.—Radix. The root.

THIS plant is perennial, and grows in South America, and some of the Caribæan islands.

The root is knotty, an inch or two long, and about half an

inch thick, of a reddish brown colour externally, and pale within : long, rough, slender fibres shoot out from all sides of it ; and are generally loaded with small round knots. It has a peculiar kind of aromatic smell, and a somewhat astringent, warm, bitterish taste, with a light and sweetish kind of acrimony, when long chewed : the fibres have little taste or smell ; the tuberous part, therefore, should be alone chosen.

This root contains so much mucilage, that a decoction of it will not pass through the filter. Neumann got from 480 parts, 190 watery extract, and afterwards with alcohol 7, and inversely 102 alcoholic, and 60 watery. I find that the tincture reddens infusion of lithmus, is precipitated by water, and has no effect on the salts of iron.

Med. use.—Contrayerva is a gentle stimulant and diaphoretic, and is sometimes given in exanthematous diseases, typhus, and dysentery. Its dose is about half a drachm.

Off. prep.—Pulv. contrayerv. comp. *Lond.*

ERYNGIUM MARITIMUM. *Eryngium. Lond. Dub.*

Willd. g. 518, sp. 6. Pentandria Menogynia.—Nat. ord. *Umbellatæ.*

Eryngo.

Off.—Radix. The root.

THIS plant grows plentifully on some of our sandy and gravelly shores : the roots are slender, and very long ; of a pleasant sweetish taste, which, on chewing them for some time, is followed by a light degree of aromatic warmth and acrimony. They are accounted aperient and diuretic, and have also been celebrated as aphrodisiac ; their virtues, however, are too weak to admit them under the head of medicines.

EUGENIA CARYOPHYLLATA. *Caryophyllus Aromaticus, Ed. Caryophylla aromatica. Dub. Caryophyllus aromatica. Lond.*

Willd. g. 972 sp. 24. Icosandria Monogynia.—Nat. ord. *Hesperideæ.*

The clove tree.

Off.—Floris germen, et oleum ejus volatile. The flower-bud and its essential oil.

THIS is a beautiful tall tree, a native of the Molucca islands. The Dutch, from a desire of monopolizing the valuable spice produced by it, destroyed all the trees except in Amboyna, where it is carefully cultivated. But their scheme has been frustrated, and the clove is now thriving in the Isle of France and other places. Every part of this tree is highly aromatic, but especially the leaf-stalk. Cloves are the flower-buds, which are gathered in October

and November, before they open, and when they are still green, and are dried in the sun, after having been exposed to smoke for some days.

Cloves have somewhat the form of a nail, consisting of a globular head, formed of the four petals of the corolla, and four leaves of the calyx not yet expanded; but this part is often wanting, being easily broken off; and a germen situated below, nearly round, but somewhat narrower towards the bottom, scarcely an inch in length, and covered with another thicker calyx, divided above into four parts. Their colour should be of a deep brown, their smell strong, peculiar, and grateful; their taste acrid, aromatic, and permanent. The best cloves are also large, heavy, brittle, and when pressed with the nail, exude a little oil. When light, soft, wrinkled, dirty, pale, and without smell or taste, they are to be rejected.

The Dutch, from whom we have this spice, frequently mix it with cloves from which the oil has been distilled. These, though in time they regain from the others a considerable share both of taste and smell, are easily distinguishable by their weaker flavour and lighter colour.

Cloves yield by distillation with water about one seventh of their weight of volatile oil; 960 parts also gave to Neumann 380 of a nauseous, somewhat astringent, watery extract. The same quantity gave only 300 of excessively fiery alcoholic extract. When the alcoholic extract is freed from the volatile oil by distillation with water, the oil that arises proves mild, and the resin that remains insipid. Its pungency therefore seems to depend on the combination of these principles. The Dutch oil of cloves is extremely hot and fiery, and of a reddish brown colour, but it is greatly adulterated, both with fixed oils and resin of cloves; for the genuine oil when recently distilled, is comparatively quite mild, and colourless, although it gradually acquires a yellow colour. It is heavier than water, and rises in distillation with some difficulty, so that it is proper to use a very low headed still, and to return the distilled water several times upon the residuum.

Medical use—Cloves, considered as medicines, are very hot stimulating aromatics, and possess in an eminent degree the general virtues of substances of this class.

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Spt. ammon comp. *Lond.* Confect. arom. *Lond.* Elect. scammon. *Lond. Dub.* Pil. aloes cum col. *Ed.*

FERRUM.

IRON is the most common of all metals. It seems even to be a constituent of organic substances, and is the only metal which when taken into the body, exerts no deleterious action upon it.

The numerous ores of it which are found in every part of the globe, may be reduced to the following genera.

1. Native iron. Immenſe iſolated maſſes of this have been found in Siberia and in South America. Their origin is ſtill perfectly problematical.

2. Carburetted iron. Plumbago.

3. Sulphuretted iron. Pyrites.

4. Oxidized iron.

a. Protoxide. Magnetic iron ore ; colour black or grey.

b. Peroxide. Not magnetic ; colour red or brown.

c. Carbonated.

d. Arſeniated.

e. Tungſtated.

The properties of iron, when obtained from any of theſe ores by the uſual proceſſes of fuſion, &c. have been already deſcribed. As its mechanical diviſion is extremely difficult, it is directed to be kept in the ſhops in the ſtate of filings or wire, and the ſcales of black oxide, which are found around the ſmith's anvil. Soft malleable iron is the only kind fit for internal uſe, as ſteel and caſt-iron always contain impurities, and often aſenic.

Medical uſe—The general virtues of this metal, and the ſeveral preparations of it, are, to conſtrict the fibres, to quicken the circulation, to promote the deficient ſecretions in the remoter parts, and at the ſame time to reſſeſs inordinate diſcharges into the inteſtinal tube. After the uſe of them, if they take effect, the pulſe is very ſenſibly raiſed ; the colour of the face, though before pale, changes to a florid red ; the alvine, urinary, and cuticular excretions, are increaſed. Fetid eructations, and the fæces voided of a black colour, are marks of their taking due effect.

When given improperly, or to exceſs, iron produces headach, anxiety, heats the body, and often cauſes hæmorrhagies, or even vomiting, pains in the ſtomach, and ſpaſms and pains of the bowels.

Iron is given in moſt caſes of debility and relaxation.

1. In paſſive hæmorrhagies.

2. In dyspeſia, hyſteria, and chloroſis.

3. In moſt of the cachexiæ, and it has been lately recommended as ſpecific in cancer.

4. In general debility produced by diſeaſe, or exceſſive hæmorrhage.

Where either a preternatural diſcharge, or ſuppreſſion of natural ſecretions, proceed from a languor and ſluggiſhneſs of the fluids,

and weakness of the solids ; this metal, by increasing the motion of the former, and the strength of the latter, will suppress the flux, or remove the suppression ; but where the circulation is already too quick, the solids too tense and rigid, where there is any stricture or spasmodic contraction of the vessels, iron, and all the preparations of it, will aggravate both distempers.

Iron is prescribed,

I. In its metallic state. *Limatura ferri.*

II. Oxidized.

a. Protoxide. *Squamae ferri. Ferri oxidum nigrum.*

1. Super-carbonated, as in the chalybeate mineral waters.

2. Sulphated. *Sulphas ferri.*

3. Combined with tartrate of potash. *Tartris ferri et potassæ.*

b. Peroxide. *Ferri oxidum rubrum.*

1. Carbonated. *Carbonas ferri.*

2. Muriated. *Murias ferri ferrugineus.*

3. Combined with muriate of ammonia. *Murias ammonia et ferri.*

FERRUM. *Lond. Ferri limatura. Ed. Ferrum in fila deductum. Dub.*

Iron. Iron-filings. Iron-wire.

IRON probably has no action on the body when taken into the stomach, unless it be oxidized. But during its oxidizement, hydrogen gas is evolved ; and accordingly we find that fetid eructations are considered as a proof of the medicine having taken effect. It can only be exhibited internally in the state of filings, which may be given in doses of from five to twenty grains, either in the form of powder, with some aromatic, or made into an electuary or bolus or pills with any bitter extract. Iron-wire is to be preferred for pharmaceutical preparations, both because it is the most convenient form, and because it is always made of the purest iron.

Off. prep.—*Ferri limatura purificata, Ed. Carbonas ferri, Ed. Lond. Dub. Aqua ferri aërat, Dub. Sulphas ferri, Ed. Lond. Dub. Tinctura ferri muriati, Dub. Ferrum ammoniacale, Lond. Ferrum tartarifatum, Lond. Vinum ferri, Lond. Dub. Hydrarg. purif. Lond. Ed.*

FERRI OXIDUM NIGRUM. *Ferri squama. Ed.*

The scales of iron.

WHEN iron is heated to redness in the smith's forge, to render it more malleable, its surface becomes oxidized by the action on

the atmospheric air; and as the oxide formed does not adhere to the iron, it is easily separated by percussion on the anvil, and flies off in the state of sparks, which, on cooling, constitute the scales of iron. In these the iron is oxidized to that degree in which it is soluble in acids, without the production of hydrogen gas; therefore, when taken into the stomach, they do not produce the distention and flatulence occasioned by the use of the filings.

Off. prep.—*Ferri oxidum nigrum purificatum, Ed. Tinctura muriatis ferri, Ed.*

SULPHAS FERRI. *Ferrum vitriolatum. Dub.*

Sulphate of iron. Green vitriol. Copperas.

THE sulphate of iron of commerce is commonly obtained by the spontaneous oxidizement of sulphuretted iron, and subsequent lixiviation and crystallization. It is never pure, and often contains zinc or copper. The copper may be separated by adding some metallic iron to the solution; but we have no means of separating the zinc; therefore we must prepare it by dissolving iron in diluted sulphuric acid, in order to obtain it in a state of purity. Its crystals are transparent rhomboidal prisms, of a fine green colour. They are soluble in two parts of cold, and in less than their own weight of boiling water. They are insoluble in alcohol.

They are composed of

Black oxide of iron,	28	} 36 Green hydro-oxide of iron.
Water of composition,	8	
		26 Sulphuric acid.
		38 Water of crystallization.

100

Green sulphate of iron is decomposed by all the earths and alkalies, and by those salts whose base forms an insoluble compound with sulphuric acid. It is also decomposed by exposure to the air, especially when in solution, and by all substances which part readily with their oxygen. The oxide of iron absorbs oxygen, and passes to the state of red oxide, which forms a red sulphate, possessing properties very different from those of the green sulphate.

Taken into the stomach, the green sulphate is apt to excite pain in the stomach, and spasms in the bowels; and in large doses it causes vomiting. In small doses, however, of from one to three grains, it is sometimes given as a tonic, astringent, or anthelmintic.

Off. prep.—*Acidum acetosum forte, Ed. Carbonas ferræ præcip. Ed. Tinctura ferri acetati, Dub. Pulvis aloet. cum ferro, Lond.*

FERULA ASSA FOETIDA. *Ed. Asa Fœtida. Lond. Dub.*
Wild. g. 539, sp. 11. Pentandria Digynia.—Nat. ord. Umbelliferae.

Asa Fœtida.

Off.—Gummi-resina. The gum-resin.

THE plant which furnishes *assa fœtida* is perennial, and a native of Persia. It has, however, borne fertile seeds in the open air in the Botanical garden of Edinburgh. The gum-resin is procured from the roots of plants which are at least four years old. When the leaves begin to decay, the stalk is twisted off, and the earth removed from about their large tapering roots. The top of the root is some time afterwards cut off transversely; and forty-eight hours afterwards, the juice, which has exuded, is scraped off, and a second transverse section is made. This operation is repeated until the root be entirely exhausted of juice. After being scraped off, the juice is exposed to the sun to harden.

It is brought to us in large irregular masses, composed of various little shining lumps or grains, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best which are clear, of a pale reddish colour, and variegated with a great number of elegant white tears.

This drug has a strong fetid smell, somewhat like that of garlic; and a bitter, acrid, biting taste. It loses some of its smell and strength by keeping, a circumstance to be particularly regarded in its exhibition.

Neumann got from 1920 parts, 1350 alcoholic extract, and afterwards 190 watery; and inversely, 550 watery. The smell resides entirely in an essential oil, which rises in distillation both with alcohol and water. Neumann got more than 60 from 1920 grains.

Medical use.—It is the most powerful of all the fetid gums, and is a most valuable remedy. It acts as a stimulant, antispasmodic, expectorant, emmenagogue, and anthelmintic. Its action is quick and penetrating.

It is often serviceable,

1. In croup.
2. In dyspepsia, amenorrhœa, and chlorosis.
3. In asthma, dyspnoea, and hysteria.
4. In tympanites and worms.

It is exhibited,

1. In substance, in the form of pills; in doses of from five to twenty grains, either alone, or combined with bitter extracts or purgatives.

2. Dissolved in some simple distilled water.
3. Dissolved in alcohol.
4. In the form of clyster, to the extent of about two drachms.

Off. prep.—*Affa foet. pur. Lond.* *Lac affæ foetidæ, Lond.* *Tinctura, Ed. Lond. Dub.* *Tinct. cast. comp. Ed.* *Spiritus ammon. foetid. Ed. Lond. Dub.* *Pil. aloes cum affa foet. Ed.* *Pil. affæ foet. comp. Ed.* *Pil. galb. comp. Lond.* *Emp. affæ foet Lond.*

FICUS CARICA. *Ed. Carica. Lond. Dub.*

Polygamia Triæcia.—*Nat. ord. Scabridæ.*

The fig tree.

Off.—*Fructus.* The fruit.

THIS tree is probably a native of Asia, but grows plentifully in the south of Europe. As the fruit is very pulpy, it is dried when it is to be preserved. To this country they are chiefly brought from the Levant. They consist almost entirely of sugar and mucilage, and are therefore demulcent. They also form a very convenient suppurating cataplasm, either roasted or boiled, and applied as hot as can be borne to parts where other cataplasms cannot easily be kept applied.

Off. prep.—*Decoct. hord. comp. Lond.* *Elect. fennæ, Ed. Lond.*

FRAXINUS ORNUS. *Ed. Lond. Dub.*

Polygamia Diæcia.—*Nat. ord. Ascryoideæ.*

Manna-ash.

Off.—*Succus concretus Manna dictus.* The concrete juice. *Manna.*

MANNA is obtained from other species of *fraxinus* besides the *ornus*, and especially from the *rotundifolia*. It is principally collected in Calabria, Apulia, and Sicily. In the warmest season of the year, from the middle of June to the end of July, a clear juice exudes from the stem and branches of these trees, which, when naturally concreted on the plants and scraped off, is called Manna in the tear; but if allowed to exude on straws, or chips of wood fastened to the tree, it is called Canulated or flaky manna. The common, or fat manna, is got by incisions made after the spontaneous exudation is over, and is in larger masses, and of a redder colour. The best Calabrian manna is in oblong, light, friable pieces or flakes, of a whitish or pale yellow colour, and somewhat transparent. The inferior kinds are moist, unctuous, and dark coloured. Manna is said to be sometimes counterfeited by a composition of sugar and honey, mixed with a little scam-

mony: there is also a factitious manna, which is white and dry said to be composed of sugar, manna, and some purgative ingredient, boiled to a proper consistence. This may be distinguished by its weight, solidity, untransparent whiteness, and by its taste which is different from that of manna.

According to Neumann, manna dissolves in alcohol. On setting the solution in a digesting heat, it gradually deposits 5-8th of the manna, of a fine white colour, light, spongy, and in some degree crystalline, melting instantly upon the tongue, and impressing an agreeable sweet taste, without any of the nauseousness of the manna. By further evaporation 1-4th more is obtained similar to manna; and on continuing the evaporation, a thick extract is formed, of the consistence of a balsam, which can scarcely be fully exsiccated, but continues moist, and resembles civet grown brown by age. In this extract, which is about one eighth, resides all the nauseous matter of the manna. It has indeed a degree of sweetish taste, but blended with a disgustful. The experiments which I have made verify these observations. The quantity of matter which a hot alcoholic solution of manna deposits on cooling is various: a saturated solution concretes into a perfectly dry white, spongy, crystallized mass. When much less concentrated, it deposits a congeries of most beautiful snow white acicular crystals. A saturated solution in boiling water also forms a solid crystallized mass on cooling. It is therefore evident that manna cannot be a species of sarcocoll, the only chemical difference between which and sugar, stated by Dr. Thomson, is its want of crystallizability.

Medical use.—Manna is a mild agreeable laxative, and may be given with safety to children and pregnant women: nevertheless, in some particular constitutions, it acts very unkindly, producing flatulency, and distension of the viscera: these inconveniences may be prevented by the addition of any grateful warm aromatic. Manna operates so weakly as not to produce the full effect of a cathartic, unless taken in large doses; and hence it is rarely given with this intention by itself. It may be commodiously dissolved in the purging mineral waters, or joined to the cathartic salts, senna, rhubarb, or the like.

Off. prep.—Syr. mannæ, *Dub.* Elect. cassiæ, *Ed. Lond. Dub.*

FULIGO LIGNI COMBUSTI. *Dub.*

Wood-foot.

This substance is inflammable, of a shining black colour, a disagreeable smell, and an empyreumatic, bitter, nauseous taste.

It varies somewhat according to the nature of the substance, and the strength of the fire employed in its production. But it consists principally of charcoal, empyreumatic oil, and acetous

acid. It sometimes contains ammonia, and the other alkalies and earths. Its medical properties are to be ascribed solely to the empyreumatic oil it contains.

FUMARIA OFFICINALIS. *Fumaria. Dub.*

Diadelphia Hexandria.—Nat. ord. *Lomentaceæ.*

Common fumitory.

Off.—Herba. The plant.

THIS is a common annual weed, in shady cultivated grounds. It is very juicy, of a bitter taste, without any remarkable smell. The alleged medical effects of this herb are, to strengthen the tone of the bowels, gently loosen the belly, and promote the urinary and other natural secretions. It is principally recommended in melancholic, scorbutic, and cutaneous disorders.

GENTIANA LUTEA. *Ed. Gentiana. Lond. Dub.*

Willd. g. 512, sp. 1. Pentandria Digynia.—Nat. ord. *Rotaceæ.*

Gentian.

Off.—Radix. The root.

GENTIAN is a perennial plant, which grows upon the Alps, Pyrenees, Appenines, and other mountainous situations in the temperate parts of Europe.

The roots are long, thick, externally of a brown colour, and wrinkled: internally spongy, and of a yellow colour, without any remarkable smell, but surpassing in bitterness all other European vegetables. Alcohol dissolves only the bitter extractive, water both the extractive and mucilage.

Neumann got from 960 grains 390 alcoholic, and afterwards 210 insipid watery extract; and inversely, 540 watery, and only 20 alcoholic.

Gentian possesses the general virtues of bitters in an eminent degree, and it is totally devoid of astringency. On dead animal matter it acts as an antiseptic. Taken into the stomach, it proves a powerful tonic, and in large doses it evacuates the intestines. It is useful in debility of the stomach, in general debility, and in gout. Combined with astringents, it cures intermittents. Externally, it is applied to putrid ulcers.

Off. prep.—Infus. g. comp. *Ed. Lond. Dub.* Tinct. g. comp. *Ed. Lond.* Vin. g. comp. *Ed.* Extract. gent. *Ed. Lond. Dub.* Tinct. rhei cum gent. *Ed.*

GEOFFRÆA INERMIS. *Ed. Geoffræa. Dub.*

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Cabbage-tree bark.

Off.—Cortex. The bark.

THE bark of this tree, which grows in the low savannahs of Jamaica, is of a grey colour externally, but black and furrowed on the inside. The powder looks like jalap, but is not so heavy. It has a mucilaginous and sweetish taste, and a disagreeable smell. But its medical effects are much greater than its sensible qualities would lead us to expect.

When properly exhibited, it operates as a powerful anthelmintic, especially in cases of lumbrici. It is given in form of powder, decoction, syrup, and extract, but should always be given in small doses. The decoction is preferred; and is made by slowly boiling an ounce of the fresh dried bark in a quart of water, till it assume the colour of Madeira wine. This sweetened is the syrup; evaporated, it forms an extract. It commonly produces some sickness and purging; sometimes violent effects, as vomiting, delirium, and fever. These last are said to be owing to an over dose, or to drinking cold water; and are relieved by the use of warm water, castor oil, or a vegetable acid.

Off. prep.—Decoct. *Ed.*

GLYCYRRHIZA GLABRA. *Ed. Glycyrrhiza. Lond. Dub. Diadelphia Decandria.*—*Nat. ord. Papilionaceæ.*

Liquorice.

Off.—Radix, extractum. The root and the extract.

LIQUORICE is a perennial plant, and a native of the south of Europe, but it is cultivated in considerable quantities in England for medical purposes; and the roots which are raised in this country, are preferred to those imported from abroad, which are very frequently mouldy and spoiled, which this root is extremely apt to be when not well preserved in a perfectly dry place. The roots are very long, about an inch thick, flexible, fibrous, externally of a brown colour, internally yellow, and, when fresh, juicy. Their taste is very sweet, combined with a slight degree of bitter, when long kept in the mouth. They are prepared for use by peeling them, cutting away all the fibres and spoiled or mouldy parts.

The powder of liquorice usually sold is often mingled with flour, and perhaps also with substances not quite so wholesome. The best sort is of a brownish yellow colour, the fine pale yellow being generally sophisticated, and it is of a very rich sweet taste, much more agreeable than that of the fresh root.

Neumann got from 960 parts of dried liquorice, 300 alcoholic extract, and afterwards 210 watery; and inversely, 540 watery, and only 30 alcoholic. The original alcoholic extract is the sweetest.

Medical use.—Its predominant constituents being saccharine and mucilaginous matter, its only action is that of a mild demulcent, and as such it is frequently used in catarrh, and in some sto-

mach complaints, which seem to arise from a deficiency of the natural mucus, which should defend the stomach against the acrimony of the food, and the fluids secreted into it.

On account of its bulk it is rarely exhibited in substance, but more frequently in infusion or decoction.

Off. prep.—Extract. glyc. *Ed. Lond. Dub.* Decoct. daph. mezer. *Ed.* Decoct. guaiaci comp. *Ed.* Decoct. hord. comp. *Lond.* Decoct. sarf. comp. *Lond. Dub.* Elect. fennæ, *Lond. Ed.* Trochisci amyli, *Lond.* Tinct. rhab. comp. *Lond.* Pil. hydrarg. *Lond. Dub.*

EXTRACTUM GLYCYRRHIZÆ GLABRÆ. *Ed.*

Extract of liquorice.

As this extract is never prepared by the apothecary, but commonly imported from other countries, the Edinburgh college have inserted it in their list of materia medica. It is imported in cylindrical rolls, covered with bay leaves. It should be perfectly black, brittle when cold, and break with a smooth and glassy fracture, have a sweet taste, without empyreuma, and be entirely soluble in water. It is prepared from the fresh roots by expression, decoction, and inspissation.

The best foreign extract of liquorice is prepared in Catalonia, but it is not so pure or so agreeable as the refined liquorice sold in the shops, in small cylindrical pieces, not thicker than a goose-quill.

Neumann got from 480 parts of Spanish extract 460 watery extract, and the residuum was not affected by alcohol; and inversely, he got 280 alcoholic, and 180 watery extract. In this last case the alcoholic extract contained all the sweetness, the watery having scarcely any taste. From the similarity of their taste, Dr. Thomson has made it a species of his new genus *sarcocoll*, but Neumann's more accurate analysis shews that it is a compound.

The extract possesses the same properties with the root, and is used for the formation of several kinds of troches.

Off. prep.—Tinctura aloes, *Ed. Dub. Lond.* Trochisci, *Lond. Dub. Ed.* Trochisci cum opio, *Ed. Dub.*

GRATIOLA OFFICINALIS. *Ed. Gratiola. Lond.*

Willd. g. 49, sp. 1. Decandria Monogynia.—*Nat. ord. Personatæ.* Hedge-hyssop.

Off.—Herba. The plant.

THIS is a perennial plant, a native of marshy situations in the south of Europe. It is gathered for use when in flower. It has no smell, but a very bitter, somewhat nauseous taste. It is a dras-

tic purgative and emetic, and a very powerful anthelmintic, but its use requires caution. In substance it may be given to the extent of half a drachm, and in infusion to three drachms.

GUAJACUM OFFICINALE. *Ed. Guaiacum. Lond. Dub. Willd. g. 819, sp. 2. Decandria Monogynia.*—Nat. ord. *Grinales.*

Guaiac.

Off.—Lignum, cortex, resina. The wood, bark, and resin.

THIS tree is a native of the West Indies, where it grows to a middling size. The wood is heavier than water, very hard, resinous, and of a greenish-black colour. Its taste is bitterish, and when kindled it gives out a pleasant smell. It is brought either in pieces, which are sometimes covered with a pale yellow alburnum, or already rasped, when by division its colour appears greenish brown, or yellow. The bark is thin, of an ash-grey, or blackish colour, and apparently composed of several laminæ. It is less resinous than the wood. Neumann got from 7680 parts of the wood 1680 alcoholic, and 280 watery extract; and inversely, 740 watery, and 960 alcoholic. From 3840 of the bark he got 560 alcoholic, and 320 watery; and inversely, 620 watery, and 240 alcoholic. The resin exudes spontaneously in tears, but is principally obtained by sawing the wood into billets about three feet long, which are then bored with an augre longitudinally. One end of these is laid upon a fire, so that a calabash may receive the melted resin, which runs through the hole as the wood burns. It may be also obtained by boiling the chips or sawings of the wood in water and muriate of soda. The resin swims at the top, and may be skimmed off.

This resin has a brownish yellow colour externally; when held against the light is transparent, breaks with a uniform smooth shining fracture, of a bluish-green colour, pulverizable into powder of a white colour, gradually becoming bluish-green, fusible in a moderate heat, but not softened by the heat of the fingers, soluble in alcohol, insoluble in water, (Neumann got from 480 parts 400 alcoholic, and only 10 watery extract; and inversely, 80 watery, and 280 alcoholic) without proper smell or taste, but when thrown on hot coals diffusing an agreeable odour, and when swallowed in a state of minute division, causing an insufferable burning and prickling in the throat. It therefore is not a gummy resin, but a pure resin. It is sometimes adulterated with colophony or common resin, but the fraud is easily detected by the smell of turpentine which they emit when thrown on live coals. Dr. Woollaston has discovered a curious property of guaiac. By exposure to air and light, it ac-

quires a green colour. This effect is produced in the greatest degree by the most refrangible rays. In the least refrangible rays it is disoxydized, and the yellow colour is restored. The same effect is produced by hot metal.

Medical use.—Taken internally, guaiac commonly excites a sense of warmth in the stomach, a dryness of the mouth, with thirst. It increases the heat of the body, and quickens the circulation. If the patient be kept warm, it produces diaphoresis; if exposed freely to the air, an increased flow of urine. In large doses it is purgative.

Guaiac is a useful remedy,

1. In rheumatism and gout.
2. In certain venereal symptoms; as in foul indolent ulcers, and a thickened state of the ligaments or periosteum, remaining after the body is reduced by a mercurial course. Guaiac will also suspend the progress of some of the secondary symptoms; but it is totally incapable of eradicating the disease.
3. In cutaneous diseases.
4. In ozæna, and scrofulous affections of the membranes and ligaments.

The wood is always exhibited in decoction. From the resinous nature of the active constituent of this substance, this cannot be a very active preparation, as the menstruum is totally incapable of dissolving, though it may suspend a little of the resin. The decoction of an ounce may be drunk in cupfuls in the course of a day.

The resin may be exhibited,

1. In substance, either made into pills, or suspended in water in the form of an emulsion. In this way from 10 to 30 grains of the resin may be taken in the day.
2. In solution; in alcohol. About half an ounce of the tincture, with three ounces of water, is a sudorific dose for an adult, if he attend to keeping himself warm.
3. Combined with an alkali.

Off. prep.—Tinct. *Ed.* Tinct. guaic. ammon. *Ed. Lond. Dub.* Pulv. aloet. cum guaic. *Lond.* Decoct. comp. *Ed.* Decoct. sars. comp. *Lond. Dub.*

HÆMATOXYLON CAMPECHIANUM. *Ed. Hamatoxy- lum. Lond. Dub.*

Willd. g. 830, sp. 10. *Decandria Monogynia.*—Nat. ord. *Lomentaceæ.*

Logwood.

Off.—Lignum, vulgo Lignum Campechense. The wood.

THIS tree was introduced from the Honduras into Jamaica, where it is now very common. The wood is firm, heavy, and of a dark red colour. Its taste is sweet, with a slight degree of astringency. It forms a precipitate with solution of gelatine, very readily soluble in excess of gelatine, and with sulphate of iron it strikes a brighter blue than any other astringent I have tried. It is used principally as a dye-wood, but also with considerable advantage in medicine.

Its extract is also sweet and slightly astringent; and is therefore useful in obstinate diarrhœas, and in chronic dysentery.

HELLEBORUS.

Willd. g. 1089. *Polyandria Polygynia*.—*Nat. ord. Multiflora*.

Sp. 2. HELLEBORUS NIGER. *Ed. Lond. Dub. Melampodium.*
Black Hellebore.

Off.—Radix. The root:

THIS plant is perennial, and grows wild in the mountainous parts of Austria, and on the Pyrenees and Appenines. The earliness of its flowers, which sometimes appear in December, has gained it a place in our gardens.

The roots consist of a black furrowed roundish head, about the size of a nutmeg, from which short articulated branches arise, sending out numerous corrugated fibres, about the thickness of a straw, from a span to a foot in length, deep brown on the outside, white, or yellowish-white within, and of an acrid, nauseous, and bitterish taste, exciting a sense of heat and numbness in the tongue, and of a nauseous acrid smell. These fibres only are used in medicine, and the head and decayed parts are rejected. For the roots of the real black hellebore, the roots of the *Adonis vernalis*, *Trollius Europæus*, *Actæa spicata*, *Astrantia major*, *Helleboris viridis foetidus*, *Veratrum album*, and *Aconitum neomontanum*, are often substituted. The last is a most virulent poison, and may be distinguished by its roots being fusiform, or nearly globular, sending out numerous very brittle fibres, of a greyish black or brown colour, as thick as a man's finger, and repeatedly divided. But the surest way to avoid mistakes, is by the apothecary cultivating the plant itself in his own garden.

Neumann got from 2880 grains 380 alcoholic, and 181 watery extract; and inversely, 362 watery and 181 alcoholic. Its active constituent seems to be of a volatile nature; for it loses its virtues by keeping, and water distilled from it has an acrid taste.

Medical use.—In large doses, hellebore is a drastic purgative; in smaller doses, it is diuretic and emmenagogue. It is princi-

pally used as a purgative in cases of mania, melancholy, coma, dropsy, worms and psora, and as an emenagogue. But its use requires very great caution, for its effects are very uncertain, and affected by many circumstances.

It is commonly exhibited in the form of extract, although its activity be much dissipated by the preparation. An infusion or tincture certainly promise to be medicines of more uniform powers. Willdenow says, that the black hellebore of the ancients is his fifth species, the *Helleborus orientalis*.

Off. prep.—Tinct. *Lond. Dub. Ed.*

Sp. 6. HELLEBORUS FOETIDUS. Helleboraster. Lond.
Bears-foot.

Off.—Folium. The leaves.

This species is native of England. It is perennial, and grows in shady places, and under hedges. The leaves have an acrid, bitter, nauseous taste, and unpleasant smell, especially when they are fresh. When dried, they are frequently given as a domestic medicine to destroy worms; but they must be used sparingly, being so violent in their operation, that instances of their fatal effects are recorded.

HORDEUM DISTICHON. Ed. Dub. Hordeum. Lond.

Willd. g. 151, sp 3. Triandria Digynia.—*Nat. ord. Gramina.*
Barley.

Off.—Semen omni cortice nudatum. The seed. Pearl barley.

BARLEY is an annual plant, cultivated in almost every country of Europe. Linnæus says, that it is a native of Tartary, but without adducing sufficient proof.

Pearl barley is prepared by grinding off the husk of rough barley, and forming the grain into little round granules, which appear of a kind of pearly whiteness. In this state barley consists almost solely of amylaceous matter, and when boiled forms an excellent article of nourishment; while a decoction of it, properly acidulated, is one of the best beverages in acute diseases.

Off. prep.—Decoct. *Ed. Lond.*

HYDRARGYRUM. Dub. Hydrargyrus. Lond. Ed.
Mercury. Quicksilver.

THE general, chemical, and physical properties of this metal, have been already enumerated. We shall now treat of it more minutely, as forming an important article in the materia medica.

It is found,

I. In its metallic state :

- a. Uncombined.
- b. Alloyed with silver.
- c. Alloyed with copper.
- d. Combined with sulphur, (Cinnabar).
- e. Combined with hydroguretted sulphur, (Æthiops minerale.)

II. Oxidized :

- a. Combined with muriatic acid.
- b. ————— sulphuric acid.

There are considerable mines of mercury in Hungary and in Spain; and what is employed in England is principally imported from the former country.

Mercury taken into the stomach in its metallic state has no action on the body, except what arises from its weight or bulk. It is not poisonous, as was vulgarly supposed, but perfectly inert.

But in its various states of combination, it produces certain sensible effects. It quickens the circulation, and increases all the secretions and excretions. According to circumstances, the habit of the body of the patient, the temperature in which he is kept, the nature of the preparation, and the quantity in which it is exhibited, its effects are indeed various: it sometimes increases one secretion more particularly, sometimes another, but its most characteristic effect is the increased flow of saliva, which it generally excites, if given in sufficient quantity. Its particular effects, and means of producing each of them, will be noticed hereafter.

From many motives, both laudable and culpable, mercury has been tortured into a greater variety of forms than any other article of the materia medica. Of these, Swediaur has given a complete table, in the late edition of his works on the venereal disease. It is too long for insertion in this place: we shall therefore give a systematic view of those mercurial preparations only which enter at least one of the British pharmacopœias.

Mercury is exhibited,

I. Purified by distillation.

Hydrargyrum purificatum. Dub. Lond. Ed.

II. Oxidized :

A. Protoxide.

- 1. By precipitation from its solution in nitrous acid, by ammonia.

Oxidum hydrargyri cinereum. Ed.

Pulvis hydrargyri cinereus. Dub.

2. By trituration :

a. With unctuous substances.

Unguentum hydrargyri. Ed.

_____ fortius. Lond. Dub.

_____ mitius. Lond. Dub.

Emplastrum ammoniaci cum hydrargyro.
Lond.

_____ lithargyri cum hydrargyro:
Lond.

_____ hydrargyri. Ed.

b. With saccharine substances.

Pilulæ hydrargyri. Lond. Dub. Ed.

c. With carbonate of lime.

Hydrargyrus cum creta. Lond.

III. Oxidized :

B. Peroxide.

1. By the action of heat and air.

Hydrargyrum calcinatum. Lond. Dub.

2. By the action of nitrous acid.

Oxidum hydrarg. rubrum per acidum nitricum.
Ed.

Hydrargyrum sub-nitratum. Dub.

Hydrargyrus nitratus ruber. Lond.

Unguentum oxidi hydrargyri rubri. Ed.

IV. Oxidized and combined with acids :

A. Protoxide.

1. With nitrous acid :

Unguentum nitratis hydrargyri. Lond. Dub. Ed.

2. With sulphuric acid :

Sub-sulphas hydrargyri flavus. Ed.

Hydrargyrum sub-vitriolatum. Dub.?

Hydrargyrus vitriolatus. Lond.

3. With muriatic acid :

a. By sublimation.

Sub-murias hydrargyri. Ed.

Hydrargyrum muriatum mite sublima-
tum. Dub.

Calomelas. Lond.

b. By precipitation.

Sub-murias hydrargyri præcipitatus. Ed.

Hydrarg. muriat. mite præc. Dub.

Hydrargyrus muriatis mitis. Lond.

4. With acetous acid :

Acetis Hydrargyri. Ed.

Hydrargyrum acetatum. Lond. Dub.

B. Peroxide.

1. Muriate.

Murias hydrargyri. Ed.

Hydrargyrus muriatus. Lond.

Hydrargyrum muriatum corrosivum. Dub.

2. Sub-muriate with ammonia.

Calx hydrargyri alba. Lond.

V. Combined with sulphur.

1. By trituration.

Sulphuretum hydrargyri nigrum. Ed.

Hydr. cum sulph. Lond.

Hydrargyrum sulphuratum nigrum. Dub.

2. By sublimation.

Hydrargyrum sulphuratum rubrum. Lond. Dub.

Mercury, or some of its preparations, is exhibited,

1. As an errhine. The sub-sulphate of mercury.
2. As a sialogogue. Mercury, in almost any form.
3. As a cathartic. The sub-muriate of mercury, (calomel).
4. As a diuretic. The oxides, the muriate, and the sub-muriate, combined with other diuretics.
5. As a sudorific. Calomel, conjoined with a sudorific regimen.
6. As an emmenagogue.
7. As an astringent. Muriate of mercury.
8. As a stimulant. Muriate of mercury.
9. As an antispasmodic.
10. As an anthelmintic.

With some of these views, mercury is frequently exhibited,

1. In febrile diseases ; in obstinate agues.
2. In inflammatory diseases ; in indolent and chronic inflammations, especially of the glandular viscera, as the liver, spleen, &c.
3. In exanthematous diseases ; variola.
4. In profluvia ; in dysentery.
5. In spasmodic diseases ; tetanus, trismus, hydrophobia, &c.
6. In cachectic diseases ; anasarca, ascites, hydrothorax, hydrocephalus, &c.
7. In impetigines ; scrofula, syphilis, lepra, icterus, &c.

8. In local diseases ; in caligo cornæ, amaurosis, gonorrhœa, obstipatio, amenorrhœa suppressionis, tumours of various kinds, herpes, tinea, psoa, &c.

Mercury occasionally attacks the bowels, and causes violent purging, even of blood. This effect is remedied by intermitting the use of the medicine, and by exhibiting opium.

At other times it is suddenly determined to the mouth, and produces inflammation, ulceration, and an excessive flow of saliva. In this case, too, the use of the mercury must be discontinued for a time ; while, according to Mr. Pearson's advice, the patient should be freely exposed to a dry cold air, with the occasional use of cathartics, Peruvian bark, and mineral acids, and the assiduous application of astringent gargles. On the other hand, the sudden suppression of ptyalism is not without danger. It is most frequently caused by cold liquids being taken into the stomach, or exposure to cold and moisture, while under the influence of mercury. The danger is to be obviated by the quick introduction of mercury, so as to affect the gums, with the occasional use of the warm bath.

Sometimes also a morbid condition of the system occurs during a mercurial course, and which tends to a fatal issue. Mr. Pearson has termed it Erethismus. It is characterized by great depression of strength ; a sense of anxiety about the præcordia ; frequent sighing ; trembling, partial or universal ; a small, quick pulse ; sometimes vomiting ; a pale contracted countenance ; a sense of coldness, while the tongue is seldom furred, or the vital or natural functions much disordered. In this state a sudden or violent exertion of muscular power will sometimes prove fatal. To prevent dangerous consequences, the mercury must be discontinued, whatever may be the stage, extent, or violence of the disease for which it has been exhibited, and the patient must expose himself freely to a dry and cool air, in such a manner as shall be attended with the least fatigue ; and in the course of ten or fourteen days, he will sometimes be so far recovered, that he may safely resume the use of mercury.

HYOSCYAMUS NIGER. Ed. *Hyoscyamus. Dub.*

Willd. g. 378, sp. 1. Pentandria Monogynia.—Nat. ord: *Solanaceæ.*

Black henbane.

Off.—Herba, semen. The herb and seeds.

HENBANE is a biennial plant, which grows in great abundance in most parts of Britain, by the road sides, and among rubbish. Its smell is strong and peculiar, and when bruised, somewhat like tobacco, especially when the leaves are burnt ; and on burning

they sparkle, as if they contained a nitrate; when chewed, however, they have no saline taste, but are insipid, mild, and mucilaginous. Henbane, in a moderate dose, often produces sweat, and sometimes an eruption of pustules, and generally sound sleep, succeeded by serenity of mind, and recruited vigour of the body; but, like the other narcotics, instead of these, it sometimes gives rise to vertigo, headach, and general uneasiness. With particular individuals, it occasions vomiting, colic pains, a copious flow of urine, and sometimes purging. In excessive doses, its effects are fatal; general debility, delirium, remarkable dilatation of the pupils of the eyes, convulsions, death. Upon the whole, like opium, it is a powerful anodyne; and, like cicuta, it is free from any constipating effect, having rather a tendency to move the belly.

Med. use.—From the writings of Dioscorides and others, it appears, that different species of Henbane have been long used in the practice of medicine. By Celsus it was applied externally as a collyrium in ophthalmia; for allaying the pain of the toothach; and he gave it internally as an anodyne.

Its use, however, was for a long period entirely relinquished, until lately revived by Dr. Störk of Vienna; and it has been used both by him and by many other practitioners, in those cases where an anodyne is requisite, and where there are objections to the use of opium. It is employed in wandering rheumatic pains, in indurations of the mammæ, from retained milk, painful swellings, whether scirrhus or not, scrofulous and cancerous ulcers, inflamed piles, and spasms of the bowels from increased irritability; under the form of a cataplasm, of the bruised leaves, with bread and milk; of an ointment, made with the powder of the leaves, with wax and oil; of a simple powder, sprinkled on the sore; or of a decoction in milk as an injection. An infusion prepared by digesting the bruised leaves in olive oil, is also usefully applied in inflammation of the bowels, kidneys, testicles, urethra, painful retention of urine, and in blind piles.

An extract from the leaves, or from the seeds, is the form in which it is given internally; and it has been used with advantage in a variety of nervous affections, as mania, melancholia, epilepsy, hysteria, trismus, and spasms from injured nerves, in rheumatism and arthritis, in glandular swellings, in obstinate ulcerations, and in every case where it is desirable either to allay inordinate action, or to mitigate pain. Its dose may be gradually increased from half a grain. Collin pushed it to the length of 30 grains for a dose.

Off. prep.—Succus pissat. *Ed.* Tinct. *Ed.*

HYPERICUM PERFORATUM. *Hypericum. Lond.*
Polyadelphus Polyandria.—*Nat. ord. Ascyroideæ.*

Common St. John's wort.

Off.—Flos. The flower.

THIS plant is perennial, and grows wild in woods and uncultivated places in Britain. Its taste is rough and bitterish, and its smell disagreeable. It abounds with vesicles, containing a transparent matter, so that when viewed, by holding the plant between the eye and the light, they resemble perforations. From the fresh flower buds, a red juice may be expressed, which imparts its colour to alcohol, water, and fixed oils. The red colour of the infusion is brightened by acids, and is changed to black by sulphate of iron. Neumann got from 480 grains, 300 of watery, and 40 of alcoholic extract; and inversely, 240 alcoholic and 120 watery. Nothing considerable arose in distillation with either water or alcohol.

HYSSOPUS OFFICINALIS. *Ed. Hyssopus. Dub.*

Willd. g. 1096, sp. 1. Didynamia Gymnospermia.—Nat. ord. *Verticillata.*

Hyssop.

Off.—Herba, folium. The herb and leaves.

Hyssop is a perennial herb which grows wild in Germany.

The leaves of hyssop have an aromatic smell, and a warm pungent taste. Their virtues depend entirely on an essential oil which rises in distillation both with water and alcohol. Besides the general virtues of aromatics, they were formerly recommended in humoral asthmas, coughs, and other disorders of the breast and lungs, and were said to promote expectoration.

INULA HELENIUM. *Enula Campana. Dub. Lond.*

Willd. g. 1489, sp. 1. Syngenesia Superflua.—Nat. ord. *Composita radiata.*

Elecampane.

Off.—Radix. The root.

THIS is a very large downy perennial plant, sometimes found wild in moist rich soils. The root, especially when dry, has an agreeable aromatic smell: its taste, on first chewing, is glutinous, and, as it were, somewhat rancid; in a little time it discovers an aromatic bitterness, which by degrees becomes considerably acid and pungent.

Neumann got from 480 grains of the dry root 390 watery, and 5 alcoholic extract; and inversely, 150 alcoholic, and 300 watery. In distillation, alcohol elevated nothing, but the distilled water was first observed by Geoffroy to be milky, and mixed with flocculi of a cineritious concrete volatile oil, partly swimming, and partly sinking in the water. He also ascertained that it was fusible, and compares it to camphor or benzoic acid. Neumann likewise examined

it, and considers it as a peculiar substance, having some resemblance to camphor. He found that it melts with a gentle heat, and when cold, appears softer and more unctuous; that it never assumes a crystalline form, but when dry proves opaque and crumbly; that laid on burning coals it totally exhales; that it is soluble in alcohol, but insoluble in water; and that by keeping it gradually loses the smell of elecampane.

Medical use.—It is a gently stimulating medicine, nearly similar in its action to angelica. The extract is merely a slight bitter, as the essential oil is totally dissipated in the preparation.

IRIS.

Willd. g. 97. Triandria Monogynia.—Nat. ord. *Enfate.*

Sp. 7. IRIS FLORENTINA. Ed. Iris. Lond.

Florentine Orris.

Off.—Radix. The root.

THIS is a perennial plant, a native of the south of Europe. The dried root is imported from Italy. It is white, flattish, knotty, and has a very slightly bitter taste, and an agreeable smell, resembling that of violets.

Neumann got from 480 parts, 77 alcoholic, and afterwards 100 watery extract, and inversely 180 watery, and 8 alcoholic. The distilled water smells a little of the root, but exhibits no appearance of oil. It is chiefly used as a perfume.

Off. prep.—Troch. amyli, *Lond.*

Sp. 24. IRIS PSEUDACORUS. Iris. Dub.

Water-flag.

Off.—Radix. The root.

THIS plant is perennial, and grows in great abundance by the brinks of rivers, and in other watery places: the root has an acrid taste; and when fresh, is strongly cathartic.

Medical use.—The expressed juice, given to the quantity of sixty or eighty drops every hour or two, and occasionally increased, has been productive of very copious evacuations, after jalap, gamboge, and other strong purgatives had proved ineffectual; and it is in this form only that it is used; for by drying, it entirely loses its purgative effects.

We have here another proof of the necessity of denominating the officinal vegetables by their systematic names; for in England, *Radix Iridis* is a pleasant perfume, in Ireland a drastic purgative; and as consultations are not unfrequently sent from the one country to the other, ignorance of this circumstance might give rise to unpleasant consequences.

ISIS NOBILIS. *Corallium Rubrum.* Lond.

Red coral.

THIS is the axis of a zoophyte of the order of ceratophyta. It is found only in the Mediterranean sea, and the sentient flesh is rubbed off by means of pumice-stone. The coral thus prepared is of a scarlet or pale red colour, and susceptible of a high polish. As an article in medicine, it is to be regarded merely as an indurated carbonate of lime.

Off. prep.—Corall. ppt. Lond. Pulv. chel. cancri comp. Lond.

JUGLANS REGIA. *Juglans.* Lond.*Monoecia Polyandria.*—Nat. ord. *Amentacea.*

The walnut-tree.

Off.—Fructus immaturus. The unripe fruit.

THIS beautiful tree, although a native of Persia, grows to a very large size, and produces ripe fruit in most parts of England. The fruit consists of a thick, fleshy, green, smooth rind, which incloses the proper nut. When unripe, they have a peculiar smell, and a bitterish astringent taste.

Medical use.—They have been supposed to possess tonic and anthelmintic virtues. The green rind has been celebrated as a powerful anti-venereal remedy; but it possesses no real anti-syphilitic virtues, although it forms a very useful addition to the compound decoction of sarsaparilla, where pains of the limbs and indurations of the membranes remain after the venereal disease has been cured by mercury, and in many of those cutaneous diseases which are attended with aridity of the skin. A decoction of the green rind has also been recommended as a useful application to old ulcers.

JUNIPERUS.

Dioecia Monadelphia.—Nat. ord. *Coniferae.**Sp.* JUNIPERUS COMMUNIS. *Ed.* *Juniperus.* Lond. Dub.

Juniper.

Off.—Baccæ, Cacumen. The berries and tops.

THIS is an ever-green shrub, growing on heaths and hilly grounds in all parts of Europe: the berries are brought from Holland and from Italy. The Italian berries are in general reckoned the best. Juniper berries have a strong not disagreeable smell, and a warm pungent sweet taste, which if they are long chewed, or previously well bruised, is followed by a bitterish one. Their predominant constituents are essential oil, and a sweet mucilaginous matter.

Medical use.—To the oil they are indebted for their stimulating carminative, diaphoretic, and diuretic properties. They are most commonly used in the form of infusion, as a diuretic drink in

dropfy. The effential oil may be separated by diffillation. It poffeffes the fame properties in a higher degree, and imparts them to ardent fpirits. The peculiar flavour, and well-known diuretic effects of Hollands, are owing to the oil of Juniper. The decoction and extract are very inert preparations.

Every part of the plant contains the fame effential oil; therefore an infufion of the tops is likewise diuretic. The wood, alfo, was formerly officinal. In warm countries a refin exudes from the juniper-tree. It is called fandarac, and is often mixed with maffich. It is not a pure refin, for, according to Mr. Giese, about one fifth of it is not folvable in water or in alcohol, but in ether, refembling in thefe refpects copal.

Off. prep.—Ol. volat. *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.*

Sp. JUNIPERUS LYCIA. *Ed. Olibanum. Lond. Dub.*
Olibanum.

Off.—Gummi-refina. A gum refin.

OLIBANUM is principally collected in Arabia, and brought from Mecca to Cairo, from whence it is imported into Europe. It confifts of transparent brittle grains of different fizes, not larger than a chefnut, of a red or yellow colour, having little tafte, and a peculiar aromatic fmell. Neumann got from 480 grains, 346 alcoholic, and 125 watery extract, and inverfely 200 watery, and 273 alcoholic. The diffilled fpirit and oil both fmelt of olibanum, but no oil feparated. It forms a transparent folution with alcohol, and a milky fluid when triturated with water: it is not fufible, but inflammable, and burns with an agreeable fmell. It is the frankincenfe of the ancients; and the diffusion of its vapour around the altar ftill forms part of the ceremonies of the Greek and Roman Catholic churches.

Sp. JUNIPERUS SABINA. *Ed. Sabina. Lond. Dub.*
Savine.

Off.—Folium. The leaf.

THIS is an evergreen fhrub, a native of Siberia and Tartary, but not unfrequent in our gardens. The leaves have a bitter, acrid, biting tafte, and a ftrong difagreeable fmell: diffilled with water, they yield an effential oil, in confiderable quantity.

Medical ufe.—Savine is a warm ftimulating medicine, capable of producing diaphorefis, and increafing all the fecretions, but apt to excite hæmorrhagy, efpecially from the uterus. It is alfo recommended as an anthelmintic, and faid to be very efficient in the cure of gout.

Internally, a conferve of the frefh leaves is exhibited in dofes of from half a drachm to a drachm.

Externally, the leaves are applied in the form of powder or in-

fufion, to warts, carious bones, and old ulcers; and in cafes of gangrene, pfora, and tinea; an excellent iffue ointment is alfo prepared with the powder. The effential oil is a very active remedy.

Off. prep.—*Ol. volat. Ed. Dub. Extract. Lond.*

KÆMPFERIA ROTUNDA. *Zedoaria. Lond.*

Willd. g. 12, fp. 2. Monandria Monogynia—*Nat. ord. Scitamineæ.*

Round Zedoary.

Off.—*Radix.* The root.

THIS is a perennial plant, a native of India. The roots are about an inch long, fomewhat rough on the furface, and often terminate in a point. They correfpond in fenfible qualities with the roots of the amomum zedoaria, but are not fo ftrong. By fome, indeed, they are fupposed to be produced from the fame plant, and that the round zedoary is the upper, and the long zedoary the under part of the root,

KINO. *Ed. Refina. Lond. Dub.*

Succus fiffatus Eucalypti refiniferæ, White iter. Kino, the infiffated juice of the brown gum tree of Botany Bay.

I HAVE found in commerce three kinds of kino, eafily diftinguifhed by their external characters.

The firft is in very fmall jet black fragments, perfectly opaque, without fmell, crackling under the teeth when chewed, not colouring the faliva, after fome time imparting only a flight aftringent tafte, not fufible, and difficultly reduced to powder. Powder dark chocolate brown. Although this has been the longeft known in commerce in this place, it does not feem to be that defcribed by Fothergill as the produce of the Pau de Sangue, and I have not been able to trace the place of its origin.

The fecond is in large fragments, on fome of which the impreffion of the veffel into which it had been received while fluid, and in which it had hardened was evident, colour very dark brown, fracture refinous, appearance homogeneous, with fmall air bells, in very thin fplinters transparent, and of a ruby red colour, crackling under the teeth when chewed, tafte at firft fomewhat acid, but afterwards becoming confiderably bitter and aftringent, fucceeded by a peculiar fweetnefs, infufible, and friable; powder of a reddifh brown. This is faid to be the extract of the *Cocoloba uvifera*, and indeed exactly refembles fpecimens certainly known to be fuch.

The third is in dark brown mafles of various fizes, either fmooth or rounded on the furface, or in fragments often covered with a reddifh brown powder, fracture refinous and very unequal, appearance fometimes homogeneous, but more commonly heterogeneous, mixed with bits of twigs, leaves, &c. fplinters transpar-

ent, ruby red, no smell, scarcely crackling under the teeth, but sometimes gritty from the accidental mixture of sand, taste simply astringent, succeeded by sweetness, and, when long chewed, a portion adheres to the teeth; infusible and friable; powder reddish brown. This is certainly obtained from the *Eucalyptus resinifera*, or brown gum tree of New-South Wales, by allowing the juice, which either flows from it spontaneously, or is procured by wounding the tree, to harden in the sun. Some specimens of it in its fluid state have even reached this country.

The analysis of kino, published in the first edition of this Dispensatory, has since been confirmed by Vauquelin, as well as the conclusion drawn from them, that it consists principally of tannin, and cannot with propriety be classed among the gum-resins. But the undoubted origin of the third kind, and the examination of a red astringent matter picked from a cavity in the *Cassuarina*, or beef-wood, prove that I was hasty in supposing that kino was always obtained from astringent barks by decoction and evaporation. Kino is much more soluble in boiling, than in cold, water. The decoction therefore on cooling, becomes turbid with a very copious red sediment. The residuum seems to be softened by the heat of boiling water, at least it agglutinates into masses resembling melted red sealing wax dropt into water. By repeated decoctions with very large quantities of water, I have never been able to exhaust it of its soluble parts: the last decoctions had still a deep red colour, and blackened solutions of iron. Nor is this residuum more soluble in alcohol, and is not fusible, but when thrown on live coals burns away without flame. Vauquelin observed that when the whole quantity of water necessary to dissolve the soluble parts of kino is not employed at once, the residuum becomes more insoluble. Alcohol dissolves the whole of the Botany-bay kino except its impurities. With a certain proportion of water this tincture lets fall a copious red precipitate, which may be separated by filtration, but with a larger proportion of water its transparency is only slightly disturbed. The solutions of kino precipitate gelatine; and, according to Vauquelin, silver, lead, and antimony, white; and, iron, green. I find that it resembles other astringents, in forming a black precipitate with red sulphate of iron, which, however, is converted into green by the slightest excess of the sulphate, and by a larger excess is dissolved into a bright green liquid.

Medical use.—It is a powerful remedy in obstinate chronic diarrhoeas and dysenteries; in all passive hæmorrhagies, especially from the uterus; in fluor albus; and in diseases arising from laxity of the solids.

It is exhibited internally, in doses of from ten to thirty grains, in substance, or dissolved in diluted alcohol.

Externally, it is applied as a styptic, to check hæmorrhagies.

from wounds or ulcers, and to diminish the discharge of sanious or ichorous matter from ill-conditioned ulcers.

Off. prep.—Tinct. *Ed. Dub.* Elect. catechu. *Ed. Dub.*

LACTUCA VIROSA. *Ed.*

Willd. g. 1404, *sp.* 12. *Syngenesia aequalis*.—Nat. ord. *Compositæ semisiliculosæ*.

Strong-scented or wild lettuce.

Off.—Folium. The leaves.

THIS plant is biennial, and grows wild on rubbish and rough banks, in many places in this country.

It smells strongly of opium, and resembles it in some of its effects; and its narcotic power, like that of the poppy heads, resides in its milky juice.

The garden lettuce when in flower it also very bitter, and abounds with a milky juice, in its taste and smell remarkably like opium, for which when dried it has been proposed and used with success as a substitute. Before it begins to shoot, it has none of that bitterness, and contains no milky juice, and probably has not those soporific effects which are commonly ascribed to the use of lettuce.

Medical use.—An extract, prepared from the expressed juice of the leaves of the plant, gathered when in flower, is recommended in small doses in dropsy. In dropsies of long standing, proceeding from visceral obstructions, it has been given to the extent of half an ounce a-day. It is said to agree with the stomach, to quench thirst, to be gently laxative, powerfully diuretic, and somewhat diaphoretic. Plentiful dilution is allowed during its operation. Dr. Collin of Vienna asserts, that out of twenty-four dropical patients, all but one were cured by this medicine.

Off. prep.—Succus spissat, *Ed.*

LAURUS.

Willd. g. 798. *Enneandria Monogynia*.—Nat. ord. *Oleraceæ*.

Sp. 1. LAURUS CINNAMOMUM. *Ed. Cinnamomum. Lond. Dub.*
The cinnamon tree.

Off.—Cortex et ejus oleum essentielle. The bark and its essential oil.

THIS valuable tree is a native of Ceylon, where it was guarded with unremitting jealousy by the Dutch, that they might monopolize the commerce of its productions. They failed, however, in the attempt; and cinnamon trees are found, not only in other parts of the East Indies, but also in Jamaica, and other islands of the West Indies. Ceylon now belongs to the British, and Captain Percival has published a very interesting account of the

cinnamon tree. It is found in greatest perfection in the immediate neighbourhood of Columbo, and grows from four to ten feet high, very bushy. The leaves resemble those of the laurel, and have the hot taste and smell of cloves when chewed. The blossom is white and very abundant, but diffuses no odour. The fruit resembles an acorn, and a species of fixed oil is obtained from it. There are several different species of cinnamon trees, or trees resembling them, in Ceylon, but four only are barked by government; the honey cinnamon, the snake cinnamon, the camphor cinnamon, which is inferior to these, and yields camphor from its roots, and mixed with gum from incisions made into it, and the *cabatte* cinnamon, which is harsher and more astringent than the others. The bark is collected at two seasons; the grand harvest lasts from April to August, the little harvest is in December. Such branches as are three years old are lopped off, the epidermis is then scraped off, the bark slit up, loosened, and removed entire so as to form a tube open at one side. The smaller of these are inserted within the larger, and they are spread out to dry. They are then packed up in bundles. The tasting of these bundles to ascertain their quality is a very disagreeable duty imposed on the surgeons, as it excoriates the tongue and mouth, and causes such intolerable pain as renders it impossible for them to continue the preparations two or three days successively. In their turns, however, they are obliged to resume it, and they attempt to mitigate the pain by occasionally eating a piece of bread and butter. It is then made up into large bundles about four feet long, and eighty pounds in weight. In stowing the bales on ship-board, the interstices are filled up with black pepper, which is supposed to improve both spices.

The best cinnamon is rather pliable, and ought not much to exceed stout writing paper in thickness. It is of a light yellowish colour; it possesses a sweet taste, not so hot as to occasion pain and not succeeded by any after taste. The inferior kind is distinguished by being thicker, of a darker and brownish colour, hot, and pungent when chewed, and succeeded by a disagreeable bitter after taste. The Dutch were accused of deteriorating their cinnamon by mixing it with a proportion of real cinnamon, but which had been deprived of its essential oil by distillation. This fraud could only be detected by the weaker smell and taste. It is also often mixed with cassia bark. This last is easily distinguishable by its fracture being smooth, and by its slimy mucilaginous taste, without any thing of the roughness of the true cinnamon.

By distillation with water, it furnishes a small quantity of very pungent and fragrant oil, the water itself remains long milky, and has a strong flavour of cinnamon. The watery extract in Neu-

mann's experiment amounted to 720 from 7680 parts. With alcohol the oil does not arise in distillation, but remains in the extract, which amounts to 960.

The essential oil of cinnamon has a whitish yellow colour, a pungent burning taste, and the peculiar fine flavour of cinnamon in a very great degree. It should sink in water, and be entirely soluble in alcohol. It is principally prepared in Ceylon.

Medical use.—Cinnamon is a very elegant and useful aromatic, more grateful both to the palate and stomach than most other substances of this class. Like other aromatics, the effects of cinnamon are stimulating, heating, stomachic, carminative, and tonic; but it is rather used as an adjunct to other remedies, than as a remedy itself.

The oil is one of the most powerful stimulants we possess, and is sometimes used as a cordial in cramps of the stomach and in syncope; or as a stimulant in paralysis of the tongue, or to deaden the nerve in toothach. But it is principally employed as an aromatic, to cover the less agreeable taste of other drugs.

Off. prep.—Aq. dest. *Ed. Lond. Dub.* Spiritus, *Ed. Lond. Dub.* Tinct. *Ed. Lond. Dub.* Tinct. card, comp. *Lond. Dub.* Spt. lav. comp. *Lond. Ed. Dub.* Tinct. catechu, *Ed. Lond.* Acid. sulph. arom. *Ed.* Emp. lad. comp. *Lond.*

Sp. 2. LAURUS CASSIA. *Ed. Cassia Ligneæ. Dub.*

The cassia tree.

Off.—Cortex, flos nondum explicitus. The bark and flower-buds gathered before they open.

This tree is very similar to the former. The bark, which is imported from different parts of the East Indies and from China, has a great resemblance to the true cinnamon, from which it is only distinguishable, by being of a thicker, and coarser appearance, and by its breaking short and smooth, while the cinnamon breaks fibrous and shivery.

It resembles cinnamon still more exactly in its aromatic flavour and pungency than in its external appearance, and seems only to differ from it in being considerably weaker, and in abounding more with a mucilaginous matter.

Cassia buds are the flower-buds which are gathered and dried before they expand. They have the appearance of a nail, consisting of a round head, about the size of a pepper-corn, surrounded with the imperfect hexangular corolla, which gradually terminates in a point. They have a brown colour, and the smell and taste of cinnamon.

Medical use.—Both the bark and buds of cassia possess the same properties with cinnamon, though in an inferior degree.

The bark is very frequently, and sometimes unintentionally, substituted for the more expensive cinnamon; and the products obtained from cassia bark and buds by distillation, are in no respect inferior to those prepared from cinnamon.

Off. prep.—Aq. dest. *Ed.* Pulv. arom. *Ed. Lond Dub.* Pulv. carb. calcis, *Ed. Lond.* Elect. arom. *Dub.* Conf. arom. *Lond.* Elect. catechu, *Lond. Dub.* Troch. cretæ, *Lond.*

Sp. 3. LAURUS CAMPHORA. *Ed. Lond. Dub.*

Camphor tree.

Off.—Camphora. Camphor.

THE camphor laurel grows in great abundance, and to a very considerable size, in the forests of Japan. It is not uncommon in green houses in England. Every part of the tree smells strongly of camphor, which is obtained from the trunk, branches, and root, by distillation. They are cut down into small pieces, and put into a still with a quantity of water. After the water has been kept boiling forty-eight hours, the camphor is found adhering to the straw with which the head of the still is lined. In this state it is imported by the Dutch, and is called crude camphor. It is very impure, consisting of small brownish or dirty-grey grains, mixed with straw, wood, hair, and other impurities. From these it is purified in Holland, by a second sublimation in glass vessels; being previously mixed with quicklime, to combine with and prevent any empyreumatic oil with which it may be contaminated from subliming, while the camphor concretes in the upper part of the vessel into cakes, convex on the one side, and concave on the other, about two or three inches thick, thinner at the edges, and generally perforated in the middle.

Pure camphor is lighter than water, very white, pellucid, somewhat unctuous to the touch, brittle, yet tough and elastic, so as to be scarcely pulverizable; shining in its fracture, and crystalline in its texture; of a bitterish, aromatic, pungent, taste, yet accompanied with a sense of coolness, of a strong and very penetrating smell; very volatile, inflammable, burning entirely away without leaving any coal or ashes; capable of combining with the fixed and volatile oils, resins, and balsams; soluble in alcohol, ether, and the concentrated sulphuric, nitric, and acetic acids; separable from these alcoholic and acid solutions by water; insoluble in water, alkalies, and the weaker acids; decomposable by heat when mixed with alumina, being converted into an essential oil and charcoal; and by treating it with nitric acid, which acidifies it, producing camphoric acid.

But the production of camphor is not confined to the laurus camphora, although it furnishes almost all the camphor of com-

merce; it is found in very great purity in interstices among the woody fibres of an unknown tree in Borneo; it is also contained in the roots of the *laurus cinnamomum* and *cassia*, *Alpinia galanga*, *amomum zedoaria*, &c.; in the seeds of the *amomum cardamomum*, *piper cubeba*, &c.; and in many indigenous plants, as in the *thymus serpyllum* and *vulgaris*, *juniperus communis*, *rosmarinus officinalis*, *salvia officinalis*, *mentha piperita*, &c. and may be separated from the essential oils of rosemary, lavender, marjoram, and sage. It is therefore now universally considered as a peculiar principle of vegetables, and not as a resin, as stated by the Dublin college.

Medical use.—Camphor is a very active substance when taken into the stomach. It increases the heat of the body considerably, and gives a tendency to diaphoresis, but without quickening the pulse. At first it raises the spirits, but produces a subsequent depression; and it facilitates voluntary motion. In excessive doses it causes syncope, anxiety, retchings, convulsions, and delirium. These violent effects of camphor are most effectually counteracted by opium.

In a morbid state of the body, camphor allays inordinate actions. When the pulse is hard and contracted, it renders it fuller and softer. It removes spasms, and stitting pains arising from spasms; and in delirium, when opium fails of procuring sleep, camphor will often succeed. It is also said to correct the bad effects of opium, mezereon, cantharides, and the drastic purgatives and diuretics.

The most general indication for the use of camphor, is the languor or oppression of the *vis vita*. It may therefore be given with advantage,

1. In all febrile diseases of the typhoid type, especially when attended with delirium.
2. In inflammations with typhoid fever, as in some cases of peripneumonia and rheumatism.
3. In eruptive diseases, to favour the eruption, or to bring it back to the skin, if from any cause it has suddenly receded, as in small-pox, measles, &c.
4. In many spasmodic diseases, especially mania, melancholy, epilepsy, hysteria, chorea, hiccough, &c.
5. In indolent local inflammations, not depending upon an internal cause, to excite action in the part.

As from its great lightness it is apt to swim upon the contents of the stomach, and to occasion pain at its upper orifice, it is necessary that it be always exhibited in a state of minute division. In order to reduce it to powder, it must be previously moistened with a little alcohol. It may then be given,

1. In powder, with sugar, magnesia, and nitrate of potash.
2. In pills, with the fetid gums and mucilage.
3. In solution, in alcohol, oil, or acetic acid.
4. Suspended in the form of an emulsion, by means of mucilage, sugar, yolk of egg, almonds, vinegar, &c.

Internally, it may be given in small doses, of from one to five grains, repeated at short intervals, as its effects are very transient, or in large doses, not under twenty grains.

Off. prep.—Ol. camph. *Ed.* Emulsio, *Ed. Lond.* Tinct. *Ed. Lond. Dub.* Acid. acet. camph. *Ed.* Tinct. opii camph. *Lond. Dub.* Tinct. sap. *Ed.* Tinct. sap. cum opio, *Ed.* Linim sap. *Lond. Dub.* Linim camph. comp. *Lond. Dub.* Cerat. lith. acet. comp. *Lond. Dub.*

Sp. 10. LAURUS NOBILIS. Ed. Laurus. Lond.

Bay tree.

Off.—Folium, Bacca ejusque oleum fixum, The leaves, berries, and expressed oil of the berries.

THIS tree is a native of the south of Europe, but bears the winters of this climate perfectly well. Both leaves and berries contain a considerable quantity of essential oil, which renders them aromatic stimulating substances.

The berries are generally brought from the Mediterranean, and are more pungent than the leaves. In Spain and Italy a considerable quantity of oil is obtained by expression from the fresh berries. It has a green colour, and strong aromatic taste and smell. As it therefore is not a fixed oil, but a mixture of fixed and volatile oil, and as its peculiar properties depend entirely on the presence of the latter, it is incorrectly stated to be a fixed oil by the Edinburgh college. It should rather have been denominated, from the mode of its preparation, an expressed oil.

Med. use.—It is only used externally as a stimulant.

Off. prep.—Decoct. pro foment. *Lond.* Cataplas. cumini, *Lond.* Emp. cumini. *Lond.*

Sp. 34. LAURUS SASSAFRAS. Ed. Sassafras. Lond. Dub.
Sassafras.

Off.—Lignum, radix, eorumque cortex. The wood, root, and bark.

THIS tree is a native of North-America, and is cultivated in Jamaica. It is the root which is commonly employed. It is brought to us in long branched pieces. It is soft, light, and of a spongy texture; of a rusty white colour; of a strong pleasant smell, resembling that of fennel; and a sweetish, aromatic subacid taste. The bark is rough, of a brown ash colour on the out-

sive, and ferruginous colour within; spongy and divisible into layers, and of a stronger taste and smell than the wood.

Neumann got from 480 grains 80 of alcoholic, and afterwards 60 of watery extract, and inversely 120 watery and 7.5 alcoholic. In distillation the alcohol elevates nothing, but water a ponderous essential oil, in the proportion of about 10 from 480.

Med. use.—Sassafras, from the quantity of volatile oil it contains, is a gently stimulating, heating, sudorific, and diuretic remedy.

It is best given in infusion. The decoction and extract are mere bitters, as the oil is dissipated by the preparation.

The essential oil may be obtained separate by distillation. It is of a whitish, yellow colour, and sinks in water. It is highly stimulating and heating, and must be given only in very small doses.

Off. prep.—Ol. volat. *Ed. Lond.* Decoct. guaiaci comp. *Ed. Decoct. sars. comp. Lond. Dub.*

LAVANDULA SPICA. *Ed. Lavendula Flos. Lond. Lavendula. Dub.*

Willd. g. 1099, sp. 1. Didynamia Gymnospermia.—Nat. ord. *Ver- ticillata.*

Lavender.

Off.—Spica florens. The flowering spikes.

LAVENDER is a well known small, shrubby, perennial plant, a native of the south of Europe, but frequently cultivated in our gardens for the sake of its perfume. There are two varieties. The flowers of both have a fragrant, agreeable smell, and a warm, pungent, bitterish taste; the broad-leaved sort is the strongest in both respects, and yields in distillation thrice as much essential oil as the other; its oil is also hotter and specifically heavier: hence, in the southern parts of France, where both kinds grow wild, this only is used for the distillation of what is called Oil of Spike. The narrow-leaved is the sort commonly met with in our gardens.

Medical use.—Lavender is a warm stimulating aromatic. It is principally used as a perfume.

Off. prep.—Ol. volat. *Ed. Lond.* Spiritus, *Ed. Lond. Dub.* Pulv. asari comp. *Ed. Lond. Dub..*

LEONTODON TARAXACUM. *Ed. Taraxacum. Lond. Dub.*

Willd. g. 1407, sp. 1. Syngenesia Æqualis.—Nat. ord. *Composita semistylulosa.*

Dandelion.

Off.—Folium, radix. The root and leaves.

This perennial plant is very common in grass fields and uncultivated

tivated places. The whole plant contains a bitter milky juice, which, however, is most abundant in the roots before the flower-stem shoots. The bitterness is destroyed by drying, and, therefore, the recent roots only should be used.

Medical use.—Its vulgar name Piss-a-bed, shews a popular belief of its possessing diuretic properties; and it was lately a very fashionable remedy in Germany, given in the form of an expressed juice or decoction, or extract prepared from either of them; but it seems to be merely a mucilaginous bitter.

LILIUM CANDIDUM. *Lilium album.* Dub.

Willd. g. 127, sp. 3. Hexandria Monogynia.—Nat. ord. *Liliaceae*.

The white lily.

Off.—Radix. The root.

THE white lily is a perennial, bulbous-rooted plant, a native of the south of Europe, and cultivated in our gardens for the beauty of its flowers. The mucilaginous root is sometimes used as a poultice, but it possesses no advantage over the poultices formed of any vegetable farina.

LINUM.

Willd. g. 590. Pentandria Pentagynia.—Nat. ord. *Gruinales*.

Sp. 1. LINUM USITASSIMUM. Ed. Linum. Lond. Dub.

Common flax.

Off.—Semen, ejusque oleum fixum. The seed, and oil expressed from the seed. Linseed, and linseed oil.

THIS valuable annual plant is said to have come originally from those parts of Egypt which are exposed to the inundations of the Nile. It now grows wild among our fields, in the south of England, and many other parts of Europe, and is cultivated in large quantities,

Linseed contains about one fifth of mucilage, and one sixth of fixed oil. The mucilage resides entirely in the skin, and is separated by infusion or decoction. The oil is separated by expression. It is one of the cheapest fixed oils; but is generally rancid and nauseous, and unfit for internal use. The cake which remains after the expression of the oil, contains the farinaceous and mucilaginous part of the seed, and is used in fattening cattle, under the name of Oil-cake.

Med. use.—Linseed is considered as emollient and demulcent. The entire seeds are only used in cataplasms. The infusion is used as a pectoral drink, and in ardor urinæ, nephritic pains, and during the exhibition of corrosive sublimate.

Off. prep.—Oleum fixum, *Ed. Lond. Dub.* Oleum lini cum calce, *Ed.*

Sp. 26. LINUM CATHARTICUM. *Dub.*

Purging flax.

Off.—Herba. The herb.

THIS is an annual plant, found wild on dry meadows and pastures in Britain. Its virtue is expressed in its title: an infusion in water or whey of a handful of the fresh herb, or a drachm of them in substance when dried, are said to purge without inconvenience.

LOBELIA SYPHILITICA. *Ed.**Syngenesia Monogynia.*—Nat. ord. *Campanacea.*

Blue cardinal flower.

Off.—Radix. The root.

THIS plant grows in moist places in Virginia, and bears our winters. It is perennial, has an erect stalk three or four feet high, blue flowers, a milky juice, and a rank smell. The root consists of white fibres about two inches long, resembles tobacco in taste, which remains on the tongue, and is apt to excite vomiting.

Dr. Barton says, that it is considerably diuretic, and Mr. Pearson found, that it generally disagreed with the stomach, and seldom failed of affecting the bowels as a strong cathartic. It certainly possesses no power of curing syphilis; even the Indians, when they have the disease, are glad of an opportunity of applying to the whites.

MALVA SYLVESTRIS. *Ed. Malva. Lond.**Willd. g.* 1290, *sp.* 43. *Monadelphia Polyandria.*—Nat. ord. *Columnifera.*

Common mallow.

Off.—Folium, flos. The leaves and flowers.

THIS is an annual plant, common in Britain, under hedges, near footpaths, and among rubbish.

The whole plant abounds with mucilage. The leaves were formerly of some esteem, in food, for loosening the belly; at present, decoctions of them are sometimes employed in dysenteries, heat, and sharpness of urine, and in general for obtunding acrimonious humours; their principal use is in emollient glysters, cataplasms, and fomentations.

Off. prep.—Decoct. pro enem. *Lond.*MARRUBIUM VULGARE. *Ed. Lond. Dub.**Willd. g.* 1111, *sp.* 8. *Didynamia Gymnospermia.*—Nat. ord. *Ver-ticillata.*

White horehound.

Off.—Folium. The leaves.

THIS is a perennial plant, which grows wild on road sides, and among rubbish. The leaves have a very strong, not disagreeable smell, and a roughish, very bitter taste. Neumann got from 480 grains, 270 watery, and 30 alcoholic extract, and inversely 150 alcoholic, and 140 watery. They promote the fluid secretions in general, and liberally taken, loosen the belly.

MEL. *Lond. Dub.*

Honey.

THIS is a well-known substance, and although it is most probably of vegetable origin, we do not procure it in any quantity except as an animal excretion, from the bee, (*apis mellifica*). This industrious insect, in the summer time, flies from flower to flower to collect the sweet juice secreted in them. When sufficiently loaded, it returns to its hive, where it deposits it, as a winter's supply, in the cells of the comb it had prepared of wax to receive it. What change it undergoes in the body of the insect is unknown; but it is certain, that honey varies very much, according to the nature of the plants from which it is collected. In some situations, where poisonous plants abound, it is even deleterious.

The best honey is that which is freest from colour, and contains the largest grains when it concretes. For medical use, it should also be as free of flavour as possible. That obtained from young bees, and which flows spontaneously from the combs, is the purest and finest, and is known by the name of Virgin honey. When separated from the wax by expression, it is less pure; and there is another sort still inferior, obtained by heating the combs before they are put into the press.

Honey consists principally of sugar, but it also probably contains mucilage and an acid, and is often impregnated with the essential oil of the flowers from which the bees have gathered it, as in the perfumed honey of the Crimea. In some parts of Asia and America, poisonous honey is met with, from the bees feeding on poisonous flowers. Neumann exsiccated honey in the water bath: the vapour which arose, he says, took fire on the approach of a candle, and diffused its smell widely; and the liquor which was condensed was manifestly impregnated, both with the smell and taste of honey, and amounted to three ounces from eight of honey.

Medical use—From the earliest ages it has been employed as a medicine. Besides the general properties of saccharine bodies, it possesses others peculiar to itself, probably depending on the presence of an acid. For internal use, sugar is always to be preferred, as honey in some constitutions produces gripes and colic pains. From its stimulus, however, it forms an excellent gargle, and for

cilitates the expectoration of viscid phlegm, and is sometimes employed as an emollient application to abscesses, and as a detergent to ulcers.

Off. prep.—Mel despum. *Lond. Dub.* Mel. acet. *Lond. Dub.* Oxytel colchici, *Lond.* Mel rosæ, *Lond. Dub.* Mel scillæ, *Lond. Dub.* Oxytel scillæ, *Lond.* Oxytel æruginis, *Lond.*

MELALEUCA LEUCADENDRON. *Ed. Cajeputa officinarum.*

Polyadelphia Polyandria.—Nat. ord. *Hesperideæ.*

The cajeput tree.

Off.—Oleum volatile. The essential oil.

THE tree which furnishes the cajeput oil is frequent on the mountains of Amboyna, and other Molucca islands. It is obtained by distillation from the dried leaves of the smaller of two varieties. It is prepared in great quantities, especially in the island of Banda, and sent to Holland in copper flasks. As it comes to us it is of a green colour, very limpid, lighter than water, of a strong smell, resembling camphor, and a strong, pungent taste, like that of cardamoms. It burns entirely away, without leaving any residuum. It is often adulterated with other essential oils, coloured with the resin of milfoil. In the genuine oil, the green colour depends on the presence of copper; for when rectified it is colourless.

Medical use.—Like other aromatic oils it is highly stimulating, and is principally recommended in hysteria, epilepsy, flatulent colic, and paralysis of the tongue. The dose is from one to four drops on a lump of sugar.

It is applied externally where a warm and peculiar stimulus is requisite; and is employed for restoring vigour after luxations and sprains; and for easing violent pain in gouty and rheumatic cases, in toothach, and similar affections.

MELISSA OFFICINALIS. *Ed. Melissa. Lond.*

Willd. g. 1118, sp. 1. Didynamia Gymnospermia.—Nat. ord. *Verticillata.*

Balm.

Off.—Herba. The herb.

BALM is a perennial plant, which grows wild on the Alps and Pyrennees, and is frequently cultivated in our gardens. It has a pleasant smell, somewhat of the lemon kind; and a weak, roughish, aromatic taste. The young shoots have the strongest flavour; the flowers, and the herb itself when old, or produced in very moist rich soils or rainy seasons, are much weaker both in smell and taste.

It is principally used in the form of a watery infusion, which is drunk in the manner of tea.

MELOË VESICATORIUS. *Ed. Cantharis. Lond. Cantharides. Dub. Lytta Vesicatoria, Fabricii.*

Insecta Coleoptera, Vesicantia.

Spanish fly. Blistering fly.

THESE insects have a longish, green, and gold-shining body, with flexible green-striped elytera, which cover the whole back of the body, and under which are their brown membranous wings. On their head they have two black articulated feelers. They are found on the fraxinus, sambucus, salix, ligustrum, &c. in Spain, Italy, France, and Germany. The largest come from Italy, but the Spanish cantharides are preferred. They are gathered by shaking the trees on which they are found, and catching them on a cloth spread beneath it. They are then killed by the fumes of vinegar, and dried carefully in a stove. The melolontha vitis is sometimes found mixed in considerable numbers with the cantharides. They are easily distinguished by their almost square body; and as probably they do not stimulate the skin, they should be picked out before the cantharides are powdered.

The analysis of cantharides, notwithstanding the experiments of Thouvenel and Beaupoil, is still extremely imperfect. Lewis ascertained that their active constituent is entirely soluble both in water and in alcohol; for extracts made with each of these solvents blistered, as far as could be judged, equally, and as effectually as cantharides in substance. Both the residua were inactive. Neumann got from 1920 grains, 920 watery, and afterwards, 28 alcoholic extract; and inversely, 400 alcoholic, and 192 watery.

Med. use.—Cantharides have a peculiar nauseous smell, and an extremely acrid burning taste. Taken internally, they often occasion a discharge of blood by urine, with exquisite pain. If the dose be considerable, they seem to inflame and ulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fetid and cadaverous; intense pains are felt in the lower belly; the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrids, and occasioning a more plentiful discharge of serum; but even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat.

The inconveniencies arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of bland emollient liquids, such as milk, emulsions, &c. The specific property of counteracting cantharides ascribed to camphor has no foundation.

The internal use of cantharides is at all times doubtful, and requires the most prudent management. They have, however,

been sometimes employed with success in dropsy, and in diseases of the urinary organs, arising from debility, especially gleet and leucorrhœa. They are given in substance, in very small doses, or in tincture.

Applied externally, they are one of our best and most powerful remedies. By proper management, they may be regulated so as to act as a gentle stimulus, as a rubefacient, or as a blister.

Blisters are applied,

1. To increase the activity of the system in general, by means of their irritation.
2. To increase the activity of a particular organ.
3. To diminish morbid action in particular organs, by means of the irritation they excite in the parts to which they are applied.

They may be employed with advantage in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brains, lungs, or liver, be at the same time particularly affected. In these cases, the blisters are not applied to the diseased organs themselves, but as near them as may be convenient. When we wish to excite action in any organ, the blisters are, if possible, applied directly to the diseased organ.

Cantharides are employed externally, either in substance, mixed up with wax and resin, so as to form a plaster or ointment, or in the form of tincture.

Off. prep.—Tinct. *Ed. Lond. Dub.* Ungt. infusi, *Ed. Lond. Dub.* Ungt. pulv. *Ed. Cerat. Lond. Dub.* Emp. *Ed. Lond. Dub.* Emp. comp. *Ed.*

MENTHA.

Willd. g. 1102. *Didynamia Gymnospermia*.—Nat. ord. *Verticillata*.

Sp. 7. MENTHA VIRIDIS. *Mentha Sativa. Lond. Dub.*
Spearmint.

Off.—Herba. The plant.

SPEARMINT is perennial, and a native of Britain. The leaves have a warm, roughish, somewhat bitterish taste; and a strong, not unpleasant, aromatic smell. Their virtues are stomachic and carminative.

Off. prep.—Aq. dest. *Lond. Dub.* Oleum volat. *Lond. Dub.* Spiritus, *Lond.*

Sp. 13. MENTHA PIPERITA. Ed. *Mentha Piperitis.* Lond. Dub.

Peppermint.

Off.—Herba. The plant.

THIS species of mint is also perennial, and a native of Britain, where it is cultivated in very great quantities, for the sake of its essential oil. The leaves have a strong, rather agreeable smell, and an intensely pungent, aromatic taste, resembling that of pepper, and accompanied with a peculiar sensation of coldness.

Its predominant constituents are essential oil and camphor, both of which rise in distillation, and are combined in what is called Oil of Peppermint.

Med. use.—Peppermint is principally used as a carminative and antispasmodic. The distilled water is a domestic remedy for flatulent colic, and the essential oil is often given with advantage, in doses of a few drops, in cramps of the stomach.

Off. prep.—Aq. dest. Ed. Lond. Dub. Ol. volat. Ed. Lond. Dub. Spirit. Ed. Lond.

Sp. 20. MENTHA PULEGIUM. Ed. *Pulegium.* Lond. Dub. Penny-royal.

Off.—Herba, flos. The herb and flower.

THIS is also perennial, and a native of Britain. In its sensible qualities, it is warm, pungent and aromatic, somewhat similar to spearmint but less agreeable. It is seldom used.

Off. prep.—Aq. dest. Ed. Lond. Dub. Ol. volat. Lond. Dub. Spirit. Lond.

MENYANTHES TRIFOLIATA. Ed. *Trifolium paludosum.* Lond. Dub.

Willd. g. 299, sp. 4. Pentandria Monogynia.—Nat. ord. Rctaceae.

Marsh trefoil.

Off.—Folium. The leaves.

THIS perennial plant is very common in marshy situations, and is one of the most beautiful of our native flowers.

The leaves grow by threes on footstalks. They are excessively bitter, and their bitterness is extracted by infusion. They are said to be sometimes used in brewing ale, and that one ounce will go as far as half a pound of hops.

Medical use.—A drachm of them in powder purges and vomits. In infusion or extract they have been recommended in intermittents, in several cachectic and cutaneous diseases. The dose of the extract is from ten to twenty grains.

MIMOSA.

Polygamia Monoecia.—Nat. ord. *Lomentacea*.

Sp. MIMOSA CATECHU. *Ed.* *Catechu. Lond. Dub.*

Catechu.

Off.—Ligni extractum, vulgo Terra Japonica. The extract of the wood.

THIS tree is a native of Hindostan. The extract of catechu, which was formerly termed, with peculiar impropriety, Japan earth, is principally prepared from the internal coloured part of the wood, by decoction, evaporation, and exsiccation in the sun. But catechu is also prepared in India from several other species of mimosa, and even from the woods, barks, and fruits of other genera.

There are two kinds of this extract; one is sent from Bombay, the other from Bengal. The extract from Bombay is of a uniform texture, and of a red brown tint, its specific gravity being generally about 1.39. The extract from Bengal is more friable and less consistent. Its colour is like that of chocolate externally; but when broken, its fracture presents streaks of chocolate and of red brown. Its specific gravity is about 1.28. Their tastes are precisely similar, being astringent, but leaving in the mouth a sensation of sweetness. They do not deliquesce, or apparently change by exposure to the air, and are not fusible.

By Mr. Davy's analysis, 200 grains gave

	BOMBAY. BENGAL.	
Tannin,	-	109
Peculiar extractive matter,	-	68
Mucilage,	-	13
Residual matter, chiefly sand and calcareous earth,	-	10
		97
		73
		16
		14

This more exact analysis confirms the observations made by me, in the first edition of this Dispensatory.

Med. use.—Catechu is one of the most convenient and powerful astringents we possess, and may be exhibited in every case where astringents are indicated. It is particularly serviceable in diarrhoea, in hoarseness from relaxation of the fauces, ulcers and aphthæ in the mouth, and in excoriations, with lymphatic exudations.

Off. prep.—Infus. *Ed.* Elect. *Ed.* Dub. Tinct. *Ed.* Lond.

Sp. MIMOSA NILOTICA. *Ed.* *Gummi Arabicum. Lond. Dub.*

Gum Arabic.

Off.—Gummi. The gum.

THIS species of mimosa grows in Arabia Petræa and Egypt. The greatest quantity of pure gum, commonly called Gum Arabic, is furnished by this tree, from which it exudes either spontaneously, or from incisions made into the bark, and afterwards hardens in the air. But a similar gum may be obtained from all the species of mimosa, and from many other trees, such as the *Swietenia febrifuga*, *Melia azadirachta*, and the different species of *Terminalia*. It is remarkable that the barks of all the trees which furnish this bland mucilaginous substance, are highly astringent; that of the *Mimosa nilotica* itself is used in India for tanning; and in our country, the cherry and plumb trees, which sometimes yield a little gum, have very astringent barks.

There are two kinds of gum found in the shops, and sold under the same name, Gum Arabic, which comes from the Levant, and East-India gum. Gum Arabic consists of roundish transparent tears, colourless, or of a yellowish colour, shining fracture, without smell or taste, and perfectly soluble in water. The pieces which are most transparent, and have least colour, are reckoned the best. They are selected from the Gum Arabic in sorts, and sold for about double the price, under the title of Picked gum. The East-India gum is darker coloured than Gum Arabic, and is not so readily soluble in water. I possess a mass of gum, gathered from a mimosa in New South Wales, by Mr. Jamieson, who is engaged in preparing for the press a most splendid and scientific description of that country. It is darker coloured even than East-India gum, and is also less soluble than it; for when suspended in water it gives off white films, which float through the mucilage. But its most remarkable property is, that it does not precipitate silicized potash; in which respect it agrees, as far as my experiments go, with gum collected in this neighbourhood, from the common cherry and plumb trees. It is also remarkable that the coarsest gum forms the thickest mucilage; at least Botany-Bay gum forms a thicker mucilage than East-India gum, and this, than Gum Arabic.

Medical use.—It possesses the powers of a mucilaginous demulcent, in a high degree; and is frequently exhibited in diarrhoea, dysentery, chincough, hoarseness, strangury, &c.; and is an extremely useful article for giving form to some remedies, and for correcting the acrimony of others.

Off. prep.—Mucilago, *Ed. Lond. Dub.* Emulsio, *Ed.* Emulsio Arabica, *Dub.* Mist. moschata, *Lond.* Mistura cretacea, *Lond. Dub.* Decoct. cornu cervi, *Lond.* Trochisci carbonatis calcis, *Ed.* Trochisci glycyrrh. *Ed.* Troch. gly. cum opio, *Ed.* Trochisci gummos, *Ed. Dub.* Pulv. cretæ comp. *Lond.* Pulv. trag. comp. *Lond.*

MOMORDICA ELATERIUM. *Ed. Cucumis Agrestis. Lond.**Dub.**Monoecia Syngenesia.*—Nat. ord. *Cucurbitaceae*.

Wild cucumber.

Off.—Fructus recens submaturus. The fresh fruit, when almost ripe.

THE plant is a native of the south of Europe, and is perennial. When cultivated in this country, it does not survive the winter. The fruit is oblong, about an inch and a half long, and an inch in diameter. It is of a green colour, and beset with stiff hairs. When nearly ripe, it bursts on a slight touch, separates from its stalk, and sheds its seeds with great violence. From this circumstance it was named by the Greeks *Elaterium*, which name was also applied to the fæcula of the juice of the fruit, the only preparation used in medicine.

Medical use.—In a few grains it operates as a drastic purgative, and is sometimes used in dropsies.

Off. prep.—Succus spissat. *Ed. Lond.***MORUS NIGRA.** *Morus. Lond.**Monoecia Tetrandria.*—Nat. ord. *Scabridæ*.

Mulberry.

Off.—Fructus. The fruit.

THIS tree, which is supposed to have come originally from Persia, bears the cold of our winters, and ripens its fruit in England. The fruit has the same properties with other sub-acid fruits. Its juice contains tartaric acid.

Off. prep.—Syr. succ. fruct. mori, *Lond.***MOSCHUS MOSCHIFERUS.** *Ed.*

The musk deer. Musk.

Off.—Materia in folliculo prope umbilicum collecta, *Moschus dicta, Ed. Moschus, Lond. Dub.* The substance contained in a follicle situated near the navel.

Manimalia.

THE musk animal is an inhabitant of the most elevated region of Asia, particularly of the Altayan Alps, and the mountains which divide Thibet from China. It is a gentle and timid animal, and its chase is difficult and dangerous. Its general form resembles the deer tribe, and it is about three feet in length. In the male, behind the navel and before the prepuce, there is situated an oval bag, flat on one side, and convex on the other, about three inches long and two broad, projecting about an inch, and having a small open orifice, beset with short hairs, which is empty

in the young animal, but in the adult is filled with a secreted matter, known by the name of Musk. When the bag becomes too full, the animal expresses part of its contents, by rubbing itself against stones or trees. The musk expressed in this manner is said to be the purest, but none of it probably reaches this country. The best musk is brought from Tonquin, an inferior sort from Agria and Bengal, and a still worse from Russia.

Fine musk comes to us in round thin bladders, which are generally about the size of a pigeon's egg, covered with short brown hairs, lined with a thin brown membrane, well filled, and without any appearance of having been opened. The musk itself is dry, with a kind of unctuousity, of a dark-reddish brown, or rusty blackish colour, in small round grains, with very few hard black clots, and perfectly free from sandy, or other visible foreign matter. If chewed, and rubbed with a knife on paper, it looks smooth, bright, yellowish, and is free from grittiness. Laid on a red-hot iron it catches flame, and burns almost entirely away, leaving only an exceedingly small quantity of light greyish ashes. The largest and fullest bag scarcely contains more than two drachms of musk.

Its taste is somewhat bitterish, and its smell extremely powerful and peculiar. Neumann got from 30 grains of musk 12 of watery, and 4 of alcoholic extract; and inversely, 10 of alcoholic, and 6 of watery. Its smell and taste were elevated in distillation with water, but not with alcohol. Neither the fixed nor volatile oils dissolved it.

The very great price of musk has given rise to many modes of adulterating it. To increase its weight, sand, and even particles of lead, are introduced through very small openings into the bags. The real musk is frequently abstracted from the bag, and its place supplied with dry and coarsely powdered blood, or some mixture with asphaltum. These adulterations are to be detected by discovering that the bag has been opened. The presence of blood is also known by the fetid smell it emits when heated sufficiently, and by the formation of ammonia, when rubbed with potash. Asphaltum is known by its shining fracture, and melting on hot iron, while musk is converted into charcoal. But there are even artificial bags filled with a composition containing some real musk. These are in general thicker, and covered with longer hair, and want the internal brown membrane which lines the real musk-bag.

Medical use.—Musk is a medicine of very great efficacy, and for which, in some cases, there is hardly any substitute. When properly administered, it sometimes succeeds in the most desperate circumstances. It raises the pulse, without heating much;

it allays spasms, and operates remarkably on the brain, increasing the powers of thought, sensation, and voluntary motion.

It may be employed in every instance of typhous fever, especially when attended with delirium, or spasmodic affection of any particular organ, or of the whole system, or subsultus tendinum, &c. It is also used with the greatest benefit in exanthematous and phlegmonic diseases, accompanied with typhoid fever; and in many spasmodic affections, as chincough, epilepsy, trismus, &c.

It is most conveniently given in substance in powder, in doses of three grains or upwards, repeated every one or two hours. Its best preparation is the tincture.

Off. prep.—Tinctura, *Dub.* Mist. mosch. *Lond.*

MURIAS.

MURIATE is the generic term for those secondary compounds which contain muriatic acid. Their general properties have been already mentioned.

The muriates may be divided into three families:

1. Alkaline muriates,—soluble in water, fusible and vaporizable without decomposition, forming no precipitate with alkaline carbonates.

2. Earthy muriates,—soluble in water in general, decomposable by heat, forming a white precipitate with alkaline carbonates.

3. Metalline muriates.—The muriatic acid is capable of combining with many metals, in two states of oxidizement. The muriates which contain the metal in the state of protoxide, are in general very acrid, and soluble both in water and alcohol. The muriates which contain the metal in the state of peroxide are often insoluble, have a white colour, and contain an excess of base, or are sub-muriates. The muriates are also the most volatile metalline salts, and often rise undecomposed in sublimation or distillation.

MURIAS AMMONIÆ. *Ed.* *Sal Ammoniacus.* *Lond.* *Dub.* *Ammonia Muriata.*

Muriate of ammonia. *Sal ammoniac.*

MURIATE of ammonia is found native, especially in the neighbourhood of volcanoes. It was first prepared in Egypt from the foot of camel-dung by sublimation: but the greatest part of that now used is manufactured in Europe; either by combining directly ammonia with muriatic acid, or by decomposing the sulphate of ammonia, by means of muriate of soda; or the muriates of lime and magnesia, by means of ammonia.

In commerce, muriate of ammonia occurs, either sublimed, in firm, round, elastic, concavo-convex cakes, or crystallized, in

conical masses. The latter commonly contain other salts, especially muriate of lime, which renders them deliquescent; and therefore the sublimed muriate of ammonia is to be preferred for the purposes of medicine.

Muriate of ammonia has an acrid, pungent, urinous taste. It is soluble in about three times its weight of water, at 60° , and in an equal weight, at 212° . During its solution, it produces 32° of cold. It is also soluble in about 4.5 parts of alcohol. It is permanent in the ordinary state of the atmosphere. By a gentle heat, it may be deprived of its water of crystallization, and reduced to the form of a white powder. At a higher temperature it sublimes unchanged. Its crystals are either six-sided pyramids, aggregated in a plumose form, or still more commonly, four-sided pyramids. It consists of 42.75 muriatic acid, 25.00 ammonia, and 32.25 water. It is decomposed by the sulphuric and nitric acids; by baryta, potash, soda, strontia, and lime; by several secondary salts containing these acids or bases; and by those metalline salts whose bases form with muriatic acid an insoluble compound.

Medical use.—Muriate of ammonia is now seldom used internally. It was formerly supposed to be a powerful aperient and attenuant of viscid humours.

Externally applied, it is a valuable remedy. It may act in two ways,

1. By the cold produced during its solution.

It is from this cause that fomentations of muriate of ammonia probably prove benencial in mania, apoplexy from plethora, lesions of the head, and in violent headachs. When used with this intention, the solution should be applied as soon as it is made.

2. By the stimulus of the salt.

On this principle we may explain its action as a discutient, in indolent tumours of all kinds, contusions, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains, and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels.

Off. prep.—Aqua ammon. *Ed. Lond. Dub.* Alcohol ammon. *Ed. Lond. Dub.* Carbonas ammon. *Ed. Lond. Dub.* Aqua carb. ammon. *Ed. Lond. Dub.* Liquor cupri ammoniat. *Lond. Dub.* Murias ammoniæ et terri, *Ed. Lond.* Calx hyd. alba, *Lond.* Spiritus am. foetid. *Lond.*

MURIAS SODÆ. *Ed. Sal Muriaticus. Lond. Sal Communis. Dub. Soda Muriata. Sal Marinus.*

Muriate of soda. Common sea-salt.

THIS is the most common of all the neutral salts. It is not only found in immense masses on and under the earth's surface, and contained in great quantities in many salt springs, but it is the cause of the saltiness of the sea.

Native muriate of soda presents two varieties, the lamellar and fibrous. It is found in Poland, Hungary, Spain, England, &c. When not perfectly pure, it is purified by solution and crystallization.

Salt springs occur in many parts of the world. The quantity of muriate of soda contained in these varies, from an inconsiderable quantity even up to one third.

Sea-water also varies much in strength. It is said to contain most salt in warm climates, and at great depths.

Muriate of soda, as obtained from these natural solutions of it by evaporation and crystallization, is seldom pure, but commonly mixed with earthy muriates, which, being deliquescent salts, dispose it to attract moisture from the atmosphere. It may, however, be purified, by precipitating the earths, by means of carbonate of soda, or by washing the crystallized salt with a saturated solution of muriate of soda, heated to ebullition. In this state it is not capable of dissolving any more muriate of soda, but will dissolve a considerable quantity of the earthy muriates.

Muriate of soda has a pure salt taste, is soluble in 2.8 times its weight of water at 60°, and in 2.76 at 212°. It is not soluble in alcohol. By the action of heat it first decrepitates, then melts, and lastly, sublimes without decomposition. The primitive form of its crystals is cubic, and they are permanent in the atmosphere. According to Kirwan, they consist of 38.88 muriatic acid, 53 soda, and 8.12 water. It is decomposed by the sulphuric and nitric acids, by potash and baryta, by secondary salts containing these, and by metalline salts whose base forms an insoluble compound with muriatic acid; it is also gradually decomposed by lime, iron, and litharge.

Med. use.—Muriate of soda is one of the most important articles in the arts, and in domestic economy. As a medicine, it is useful in some cases of dyspepsia; and in large doses it is said to check vomiting of blood. It is a common ingredient in stimulating clysters, and is sometimes applied externally, as a fomentation to bruises, or in the form of bath, as a gentle stimulus to the whole surface of the body.

Off. prep.—Murias sodæ exsiccat. *Ed. Dub. Acid muriat. Ed.*

Lond. Dub. Murias antim. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.*

MYRISTICA MOSCHATA. *Ed. Myristica. Lond. Dub:*
Monoecia Monandria.—Nat. ord. *Oleracea.*

The nutmeg-tree.

Off.—Fructus nucleus, *Nux moschata* dictus; ejusque oleum expressum, *Oleum macis* dictum; necnon oleum nucis volatile; denique, nucis involucrum. The kernel of the fruit commonly called Nutmeg; its essential oil; its expressed oil, called Oil of Mace; the involucrum of the nut, called Mace.

THE tree which furnishes this elegant spice is a native of the Molucca islands. It is not, however, cultivated in any of them except Banda, from which all Europe has been hitherto supplied with mace and nutmeg. The entire fruit is about the size of a peach, and is marked with a longitudinal furrow. The external covering is smooth, fleshy, and bitter. As the fruit ripens, this bursts, and discloses the mace, which is an oily membranous pulp, of a dark-red colour, and aromatic flavour, divided into narrow branched slips. Within the mace is inclosed the nut, which consists of a brown, thin, hard shell, and a fat perenchymatous kernel, of an oval shape. The fruit is gathered three times a-year. The external covering is separated on the spot, and the mace and nut carried home, where they are carefully dried in the sun. After they are dried, the nutmegs are dipt in lime water, and the mace is sprinkled with salt water, probably to preserve them from the attacks of insects.

Mace, by drying, acquires a reddish-yellow colour, When good, it is flexible, thin, oily, of a deep colour, has a strong, agreeable smell, and an aromatic, bitterish acrid taste. When brittle, divided into fewer slips, of a whitish, or pale yellow colour, and of little smell or taste, it is to be rejected.

Neumann got from 7680 parts of mace, 2160 alcoholic, and 1200 watery extract; and inversely, 1920 watery, and 1440 alcoholic extract, with 300 of volatile oil heavier than water, which arose during the inspissation of the watery extract. The expressed oil of mace is less consistent than that of nutmegs.

Nutmegs are oval, flattened at both ends, of a grey-brown colour, and reticularly furrowed on the outside, of a yellow colour within, variegated with brown undulating lines, solid, hard, unctuous to the feel, and easily cut with a knife; and have a balsamic smell, and agreeable aromatic taste. The small round nutmegs are better than the large oval ones; and they should have a strong smell and taste, and should neither be worm-eaten, musty, nor variegated with black lines. Their activity is, how-

ever, confined to the dark coloured veins, which are not apt to be worm-eaten.

Neumann got from 1920 parts of nutmeg, 480 of an oily alcoholic extract, and 280 watery, with 320 fixed oil: these two last were both insipid: and inversely, 600 watery extract, with 50 of fixed oil, which rose to the surface during the inspissation, and 10 of volatile oil which distilled over; and afterwards, 120 unctuous alcoholic extract, and 300 more of fixed oil. By expression 1920 gave 540 of oil, and afterwards 480 of watery extract, a pretty strongly tasted distilled water, and 80 unctuous alcoholic extract, with 60 of insipid fixed oil.

Off. prep.—Spirit. nucis moschat. *Ed. Lond. Dub.* Spirit. lav. comp. *Ed. Lond. Dub.* Pulv. carb. calcis comp. *Ed.* Confectio aromat. *Dub. Lond.* Elect. catechu, *Ed. Dub.* Trochisci carb. calcis, *Ed.*

Volatile oil of nutmeg. By distillation they yield a considerable quantity of essential oil, of a whitish yellow colour, lighter than water, and possessing the aromatic taste and smell in an eminent degree. In doses of a few drops, it is a powerful carminative and stomachic.

Off. prep.—Spirit. alk. volat. aromat.

Expressed oil of mace. Nutmegs also yield by expression a considerable quantity of limpid yellow oil, which, on cooling, concretes into a sabaceous consistence. They are previously beaten to a soft paste in a warm mortar, then inclosed in a linen bag, exposed to the vapour of hot water, and squeezed in a press, of which the plates have been heated.

It is a mixture of the volatile oil on which their flavour depends, and of a fixed oil, of a white colour, without taste or smell; and as the properties which characterize it depend on the presence of the volatile oil, the denomination of Fixed oil, applied to it by the Edinburgh college, is less correct than that of Expressed oil, given to it by the other colleges, from the manner of its preparation.

In the shops we meet with three sorts of unctuous substances called Oil of mace, though really expressed from the nutmeg. The best is brought from the East Indies, in stone jars; this is of a thick consistence, of the colour of mace, and an agreeable fragrant smell. The second sort, which is paler coloured, and much inferior in quality, comes from Holland, in solid masses, generally flat, and of a square figure. The third, which is the worst of all, and usually called Common oil of mace, is an artificial composition of suet, palm oil, and the like, flavoured with a little genuine oil of nutmeg. 7680 of the second sort yielded to Neumann 330 volatile oil heavier than water, 2830 of fluid express-

ible oil, and 4560 of solid, but fusible, sebaceous matter, perfectly insipid, inodorous, and of a chalky whiteness.

Off. prep.—Emp. lad. comp. *Lond.*

Medical use.—Both mace and nutmegs are rather to be considered as aromatic spices, than as articles of medicine. From the essential oil they contain, they are heating and stimulating; and they are added to other medicines for the sake of their agreeable flavour.

MYROXYLON PERUIFERUM. *Ed.*

Willd. g. 829, *sp.* 1. *Decandria Monogynia.*—*Nat. ord. Lomentaceæ.*

Sweet-smelling balsam tree.

Off.—Balsamum; Balsamum Peruvianum. *Lond. Dub.* Peruvian balsam.

THIS tree grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice, even the leaves are full of transparent resinous points, like those of the orange tree.

The balsam, as brought to us, is commonly of the consistence of thin honey, of a reddish-brown colour, inclining to black, an agreeable aromatic smell, and a very hot biting taste.

It is very often adulterated; and sometimes what is sold for Peruvian balsam, is a spurious mixture of resin and essential oil, flavoured with benzoin. These frauds are not easily detected, and fortunately they are of little importance.

It is said to be obtained by boiling the cuttings of the twigs in water, and skimming off with a spoon the balsam, which swims on the top.

By incision this tree yields a much more fragrant white or colourless balsam, which, when inspissated by the heat of the sun, forms the red or dry balsam of Peru; but it is very rarely in use in Britain, and almost never to be met with in our shops.

Peruvian balsam consists of a volatile oil, resin, and benzoic acid; it is, accordingly, entirely soluble in alcohol, and in essential oils. Water dissolves part of the benzoic acid, and fixed oil combines with the resin. It may be suspended in water, by trituration with mucilage and yolk of egg.

Med. use.—Balsam of Peru is a very warm aromatic medicine, considerably hotter and more acrid than copaiva. Its principal effects are, to warm the habit, and to strengthen the nervous system. Hence its use in some kinds of asthmas, gonorrhœas, dysenteries, suppressions of the uterine discharges, and other disorders proceeding from a debility of the solids. It is also employed

externally, for cleansing and healing wounds and ulcers, and sometimes against palsies and rheumatic pains.

Off. prep.—Tinctura, *Lond.* Troch. glyc. comp. *Dub.*

MYRRHA. *Ed. Lond. Dub.*

Myrrh.

Off.—Gumma-resina. The gum-resin.

THE tree which produces this gum-resin is not yet ascertained. Mr. Bruce has given some reasons for supposing that it is a mimosa; but we may observe, that all the mimosas with which we are sufficiently acquainted furnish a pure gum, and not a gum-resin. The best myrrh is brought from Troglodytitia, a province of Abyssinia, on the borders of the Red sea; but what we receive comes from the East Indies, and is produced on the eastern coast of Arabia Felix.

The best myrrh is in the form of tears. It should be of a yellow, or reddish-yellow colour, becoming redder when breathed on; light, brittle, of an unctuous feel, pellucid, shining; presenting white semi-circular striæ in its fracture; of a very bitter aromatic taste, and a strong, peculiar, not unpleasant odour. It is not good if whitish, dark-coloured, black, resinous, ill-smelled, or mixed with impurities, which is too commonly the case.

Neumann ascertained that water and alcohol are both of them capable of taking up the whole of the taste and smell of the myrrh, the extract made by either after the other being insipid. The alcohol distilled from the tincture elevated none of the flavour of the myrrh; but during the inspissation of the decoction a volatile oil arose, containing the whole of the flavour of the myrrh, and heavier than water, while the extract was merely bitter. From 7680 parts of myrrh he got 6000 watery extract, 180 volatile oil, and 720 alcoholic; and inversely, 2400 alcoholic, and 4200 watery. I have observed that the tincture is transparent, and when poured into water, forms a yellow opaque fluid, but lets fall no precipitate, while the watery solution is always yellow and opaque; and that myrrh is not fusible, and is difficultly inflammable. Mr. Hatchett found it soluble in alkalies.

Med. use.—Myrrh is a heating stimulating medicine. It frequently occasions a mild diaphoresis, and promotes the fluid secretions in general. Hence it proves serviceable in cachectic diseases, arising from inactivity of the system, and is supposed to act especially upon the uterine system, and to resist putrefaction.

It is exhibited,

1. In substance; in the form of powder, or made up into pills, in doses of 10 to 60 grains.

2. Dissolved in water, as in Griffiths' famous, but unchemical, myrrh mixture.
3. Dissolved in alcohol.

Off. prep.—Tinctura, *Ed. Lond. Dub.* Tinct. aloes æther. *Ed.* Tinctura aloes cum myrrha, *Ed. Lond.* Pulv. myrrhæ comp. *Lond.* Pulv. aloes cum ferro, *Lond.* Pil. galb. comp. *Lond.* Pil. rhœi comp. *Ed.* Pil. aloes cum myrrha, *Lond. Ed.* Pil. assæ feet. comp. *Ed.*

MYRTUS PIMENTA. *Ed. Pimento. Lond. Dub.*

Willd. g. 973, sp. 28. Icosandria Monogynia.—Nat. ord. *Hesperideæ.*

Pimento tree.

Off.—Fructus, vulgo Piper Jamaicense. The fruit, commonly called Jamaica Pepper.

THIS is a native of Jamaica, and grows in all the woodlands on the north side. Soon after the trees have blossomed, the berries become fit for gathering; the fruit not being suffered to ripen, as in that state it is moist and glutinous, and therefore difficult to cure, and when dried becomes black and tasteless. The berries are dried by spreading them on a terrace, exposed to the sun for about seven days, during which time they gradually lose their green colour, and become of a reddish-brown.

The smell of this spice resembles a mixture of cinnamon, cloves, and nutmegs; its taste approaches to that of cloves, or a mixture of the three foregoing; whence it has received the name of *allspice*.

Neumann ascertained that its flavour resides entirely in a volatile oil heavier than water, and its pungency in a resin or a substance soluble in alcohol and insoluble in water. From 480 parts he got 120 watery extract, 30 volatile oil, and 20 alcoholic extract; and inversely, 66 alcoholic and 100 watery.

Med. use.—Pimento is a warm aromatic stimulant, and is much used as a condiment in dressing food. As a medicine, it may be advantageously substituted for the more costly spices, especially in hospital practice.

Off. prep.—Aq. destil. *Ed. Lond.* Ol. volat. *Ed.* Spirit. *Ed. Lond. Dub.* Syr. spin. cerv. *Lond.* Pil. opii, *Ed.*

NICOTIANA TABACUM. *Ed. Nicotiana. Lond. Dub.*

Willd. g. 379, sp. 1. Pentandria Monogynia.—Nat. ord. *Solanaceæ.*

Tobacco.

Off.—Folium. The leaves.

THIS is an annual plant, a native of America, from whence it was first brought into Europe, about the year 1560. It is now sometimes cultivated for medicinal use in our gardens; but in general it is imported from America in large quantities. The leaves are about two feet long, of a pale green colour whilst fresh, and when carefully dried of a lively yellowish cast. They have a strong, disagreeable, narcotic smell, and a very acrid burning taste.

The active constituent of tobacco is an essential oil; for, by long boiling, the decoction and extract of tobacco become almost inert; and, by distillation an oil is obtained from it, so active, that small animals are almost instantly killed, when wounded by a needle dipped in it.

Medical use.—On the living body, whether taken into the stomach in substance or solution, or into the lungs in the form of smoke, or applied to abraded surfaces, tobacco is capable of producing deleterious effects. It often proves virulently cathartic or emetic, and occasions intolerable cardialgia, anxiety, and vertigo.

The system becomes easily habituated to the action of tobacco; and many people use very large quantities of it in several ways as a luxury, without experiencing any other bad effect than what arises from their being unable to relinquish it after the habit is confirmed.

As a medicine it is exhibited in various forms:

1. In substance. When chewed, it causes an increased flow of saliva, and sometimes relieves the toothach; and reduced to powder, it proves an excellent errhine and sternutatory, when snuffed up the nostrils.
2. In infusion in water or wine. Taken in such small doses as to have little effect on the stomach, it proves powerfully diuretic, and was employed by Dr. Fowler with very great success in cases of dropsy and dysuria. It is also applied externally for the cure of psora, tinea, and other cutaneous diseases.
3. In the form of smoke, it is injected into the anus by means of bellows of a peculiar construction. By acting as a stimulus to the rectum, it sometimes succeeds in reviving the vital powers in some kinds of asphyxia, and in evacuating the intestines in cases of obstinate constipation.

Off. prep.—*Vin. nicot. tabac. Ed.*

NITRAS.

NITRATE is the generic term for secondary compounds, which consist of nitric acid, combined with any base. Their general characters have been already mentioned. There are three families of nitrates.

1. Alkaline nitrates;—soluble in water; solubility increased by increase of temperature; crystallizable; forming no precipitate with alkaline carbonates.

2. Earthy nitrates;—soluble in water; forming a white precipitate with alkaline carbonates.

3. Metallic nitrates;—generally soluble, both in water and in alcohol; decomposable by heat, furnishing nitric oxide gas, and leaving the metal oxidized to a maximum.

NITRAS POTASSÆ. *Ed. Lond. Dub.*

Nitrate of potass.

Off.—Nitrum. Nitre.

NITRATE of potass is annually produced on the surface of the earth in many countries. For this production, the presence of a calcareous base, heat, and an open, but not too free, communication with dry atmospheric air, are requisite. The putrefaction of organic, especially animal substances, is not necessary to, but accelerates the formation of, this salt, by affording the azote in a state in which it combines readily with the oxygen of the atmosphere, and forms the nitric acid. Accordingly, in Germany and France, nitrate of potass is prepared, by exposing mixtures of putrefying animal and vegetable substances, and calcareous earths, to the action of the atmosphere. The salt is afterwards extracted by lixiviation and crystallization. The nitre used in this country is chiefly imported from the East Indies. As it occurs in commerce, it often contains a little muriate of potass and muriate of soda, from which it is easily purified by dissolving it in boiling water, and filtering it; on cooling, the nitrate of potass crystallizes, and the other salts remain dissolved.

Nitrate of potass has a sharp, bitterish, cooling taste. It shoots in pretty large crystals, which are generally six-sided prisms, terminated by six-sided pyramids; very brittle, and permanent in the atmosphere; soluble in seven times their weight of water at 60° , and in an equal weight at 212° ; melting when exposed to a strong heat, giving out at first oxygen, and afterwards nitrogen gas, until the whole acid be decomposed, and the potass alone remain behind. It deflagrates more or less violently with all oxygenizable substances, oxidizing or acidifying them. When dried in a temperature of 70° , it consists, according to Kirwan, of 44 nitric acid, 51.8 potass, and 4.2 water. It is decomposed by the sulphuric acid and baryta, by the muriate and acetite of baryta, and the sulphates of soda, ammonia, magnesia, and alumina.

Medical use.—Taken to the extent of from a drachm to half an ounce in the course of a day, in repeated doses, it diminishes the heat of the body, and the frequency of the pulse, operates by stool, and acts upon the secretion of urine, but is apt to produce

pains in the stomach. In large doses, such as an ounce, taken at one time, it produces the most dreadful symptoms, constant vomiting, purging, mixed with blood, convulsions and death. Accidents of this kind have happened from its being sold by mistake for sulphate of soda.

It is best given in small doses, as five to ten grains frequently repeated, and is only admissible in inflammatory diseases. Externally it is used in gargles, for inflammatory sore throats.

Off. prep.—Acid. nitr. *Lond. Ed. Dub.* Nitr. purif. *Lond.* Sulphas pot. cum sulph. *Ed.* Antim. calc. *Lond.* Oxid. ant. cum sulph. per nitrat. pot. *Ed. Lond. Dub.* Trochisci nitri, *Ed. Lond.*

OLEA EUROPÆA. *Ed. Oliva. Lond. Dub.*

Willd. g. 36, sp. 1. Diandria Monogynia.—Nat. ord. *Sepiariæ.*

The olive tree.

Off.—Fructus, ejusque oleum expressum. The fruit and oil expressed from the fruit.

THIS tree is a native of the south of Europe and north of Africa. It is cultivated in France, Spain, and Italy, for the sake of its fruit and the oil expressed from it. Olives, when fresh, have an acrid, bitter, extremely disagreeable, taste; but they are only eaten when pickled. They are first steeped for several days in a ley of wood-ashes, and then pickled in a strong solution of muriate of soda.

They are principally valued for the oil they afford by expression.

For this purpose they are gathered when fully ripe, and immediately bruised and subjected to the press. The finest oil flows first, and a very bad oil is obtained by boiling the magma, which remains after expression, in water. According to Beaumé, they are gathered when sufficiently ripe. They are then dried, to deprive the mucilage, of which they contain a large quantity, of its water, and are expressed after being bruised, and moistened with a little water to render the oil more fluid. By rest, the mucilage and water which may have passed with it, separate. It is sometimes mixed with oil of poppy seeds; but, by exposing the mixture to the freezing temperature, the olive oil freezes, while that of the poppies remain fluid; and as oils which freeze with most difficulty are most apt to become rancid, olive is deteriorated by the admixture of poppy oil.

Good olive oil should have a pale yellow colour, somewhat inclining to green, a bland taste, without any rancidity, and no smell, and should congeal at 38° Fahrenheit. In this country it is frequently rancid, and sometimes adulterated.

Medical use.—Taken internally, it operates as a gentle laxative, and is given in cases of worms. It is also given in large quantities to mitigate the action of acrid substances taken into the sto-

mach. It is used externally in frictions, in gargles, and in clysters; but its principal employment is for the composition of ointments and plasters.

Off. prep.—Oleum ammoniat. *Ed. Lond.* Oleum camph. *Ed.* Oleum sulph. *Ed. Lond.* Linim. simp. *Ed.* Unguent. simp. *Ed.* Unguent. sper. ceti, *Lond. Dub.* Unguentum ceræ, *Lond. Dub.* Cerat. simp. *Ed.* Cer. sper. ceti, *Lond. Dub.* Unguent. resin. flavæ, *Lond. Dub.* Unguent. elemi, *Lond. Dub.* Unguent. sambuci, *Lond. Dub.* Emplast. oxidi plumbi semivitrei, *Ed. Lond. Dub.* Ceratum saponis, *Lond. Dub.* Ung. ceruss. acet. *Lond. Dub.* U. lith. acetat. *Lond. Dub.* Emplast. hyd. *Ed.* Cerat. lap. cal. *Lond. Dub.* Emplast. oxidi ferri rubri, *Ed.*

ONISCUS ASELUS. *Millepeda. Lond.*

Insecta aptera.

Slaters killed by the vapour of alcohol.

THESE insects are found in cellars, under stones, and in cold moist places; in warm countries they are rarely met with. They have a faint disagreeable smell, and a somewhat pungent, sweetish, nauseous taste.

Neumann got from 480 parts 95 watery, and ten alcoholic extract: and inversely 52 alcoholic, and 45 watery. Nothing rose in distillation with either.

Their medical virtues have been very much over rated.

Off. prep.—Millepedæ ppt. *Lond. Dub.*

ORIGANUM.

Willd. g. 1116. Didynamia Gymnospermia.—*Nat. ord. Verticillata.*

Sp. 10. ORIGANUM VULGARE. Origanum. Lond. Dub.

Wild marjoram.

Off.—Herba. The herb.

THIS is a perennial plant, and is met with upon dry chalky hills, and in gravelly soils, in several parts of Britain. It has an agreeable smell, and a pungent taste, warmer than that of the garden marjoram, and much resembling thyme, with which it seems to agree in virtue. An essential oil distilled from it is kept in the shops, and is very acrid.

Off. prep.—Ol. volat. *Lond. Dub.*

Sp. 15. ORIGANUM MAJORANA. Ed. Majorana. Lond. Dub.

Sweet marjoram.

Off.—Herba. The plant.

SWEET marjoram is an annual plant, which grows wild in Portugal, but is cultivated in our gardens, principally for culinary pur-

poses. It is a moderately warm aromatic, yielding its virtues both to aqueous and spiritous liquors by infusion, and to water in distillation.

Off. prep.—Pulv. asari comp. *Ed. Lond. Dub.*

OSTREA EDULIS. *Ostrea. Lond. Dub.*

Cl. *Vermes.* Ord. *Testacea.*

Oyster.

Off.—Testa. The shell.

THE oyster is a very nutritious article of diet, and in some diseases not only admissible, but even advantageous. Their shells, which are officinal, are composed, like all the mother-of-pearl shells, of alternate layers of carbonate of lime, and a thin membranaceous substance, which exactly resembles coagulated albumen in all its properties. By burning, the membrane is destroyed, and they are converted into lime, which, although very pure, possesses no advantage over that of the mineral kingdom.

Off. prep.—Ost. test. ppt. *Lond. Dub.*

OVIS ARIES. *Ed. Ovis. Lond. Dub.*

Cl. *Mammalia.* Ord. *Ruminantia.*

The sheep.

Off.—Adeps. Mutton-suet.

MUTTON is a highly nutritious and wholesome food. Ewe-milk is thick and heavy, and contains much cream and little whey. The cheese made from it has a bitter biting taste, especially when old, and is supposed to be stomachic. Mutton-suet is officinal, for the purpose of giving consistency to ointments and plasters.

Off. prep.—Sebum ppt. *Lond.* Emplast. ceræ. *Ed. Lond. Dub.* Ungt. elemi, *Lond. Dub.* Ungt. picis, *Lond. Dub.* Ungt. sambuci, *Lond. Dub.* Emp. mel. vesic, *Ed.* Ungt. hydrarg. *Ed. Lond. Dub.*

OXALIS ACETOSELLA. *Lujula. Lond. Acetosella. Dub.*

Willd. g. 918, sp. 25. Decandria Pentagynia.—Nat. ord. *Gruinales.*

Wood-forrel.

Off.—Folium. The leaves.

THIS is a small perennial plant, which grows wild in woods, and shady hedges. The leaves contain a considerable quantity of super-oxalate of potass, and have an extremely pleasant acid taste. They possess the same powers with the vegetable acids in general, and may be given in infusion, or beaten with sugar into a conserve, or boiled with milk to form an acid whey. The super-oxalate of potass is extracted in large quantities from them, and sold under the name of *Essential Salt of Lemons.*

Twenty pounds of the fresh leaves yielded to Neumann six pounds of juice, from which he got two ounces two drachms and a scruple of salt, besides two ounces and six drachms of an impure saline mass.

Off. prep.—*Conserva, Lond. Dub.*

PÆNEA SARCOCOLLA. *Sarcocolla. Lond.*

Willd. g. 218, sp. 1. Tetrandria Monogynia.—*Nat. ord. Conglomerata.*

Sarcocoll.

Off.—*Gummi refina.* A gum-resin.

THE plant is a native of Ethiopia, and yields the sarcocoll by spontaneous exudation. The tears of sarcocoll are seldom so large as peas, and have either a pale red or yellowish white colour. They are extremely brittle, or rather friable, shining in their fracture, resembling a good deal gum-arabic in coarse powder, but rather more opaque. They have no smell, but a bitter taste, combined with a sweetness like that of liquorice. Neumann obtained from 480 parts, 360 of alcoholic, and afterwards 40 of watery extract, and inversely 450 watery, and 26 alcoholic. In distillation nothing arose. It is not fusible, and kindles with difficulty. Dr. Thomson considers sarcocoll as a peculiar vegetable principle, which he defines to be soluble in water and in alcohol, taste bitter sweet, and uncrySTALLIZABLE. Manna, one of his species is, however, very crystallizable. Sarcocoll was supposed to possess peculiar virtues in agglutinating wounds.

Off. prep.—*Pulv. cerussæ comp. Lond.*

PANAX QUINQUEFOLIUM. *Ginseng. Lond.*

Polygamia Dioecia.—*Nat. ord. Hederacæ.*

Ginseng.

Off.—*Radix.* The root.

THIS is a perennial plant, which grows in Tartary and North America. The root is about the thickness of the little finger; an inch or two in length, often dividing into two branches; of a whitish-yellow colour, wrinkled on the surface; of a compact, almost horny texture; when broken, exhibiting a resinous circle in the middle, of a reddish colour. It has no smell, but a very sweet taste, combined with a slight degree of aromatic bitterness.

The Chinese, probably on account of its scarcity, have a very extraordinary opinion of the virtues of this root, so that it sells for many times its weight of silver. The Americans, on the contrary, disregard it, because it is found plentifully in their woods. In fact, it is a gentle and agreeable stimulant.

PAPAYER.

Willd. g. 1015. Polyandria Monogynia.—Nat. ord. *Rhæades*.

Sp. 5. PAPAVER RHOEAS. Papaver erraticum. Lond.

Corn-rose, or red poppy.

Off—Flos. The flower.

THIS species of poppy is annual, and very common in our corn fields. The petals give out a fine red colour when infused, and are supposed to possess slightly anodyne properties.

Off. prep.—Syr. papav. erratici, *Lond.*

Sp. 7. PAPAVER SOMNIFERUM. Ed. Papaver album. Lond. Dub.

White poppy.

Off.—Capsula, ejusque succus spissatus, *Opium dictus*. The capsules and their inspissated juice, commonly called Opium.

THE white poppy is also an annual, and is sometimes found wild in this country, but it is probably originally a native of the warmer parts of Asia.

In this country it is frequently cultivated for the beauty of the varieties of its flowers, and for its seeds. Some attempts have been made to obtain opium from its capsules; and Mr. Ball received a premium from the society for encouraging the arts, for specimens of British opium, in no respect inferior to the best eastern opium. But we apprehend that the climate of this country is an insuperable obstacle to its becoming a profitable branch of agriculture.

The leaves, stalks, and capsules, of the poppy, abound with a milky juice, which may be collected in considerable quantity by slightly wounding them when almost ripe: this juice, exposed for a few days to the air, thickens into tenacious tears, which in fact is opium. These are then worked up into masses, and covered with poppy or tobacco leaves. By decoction and expression this juice is partially extracted, together with a considerable quantity of mucilage. The liquor strongly pressed out, suffered to settle, clarified with whites of eggs, and evaporated to a due consistence, yields about one fifth, or one sixth the weight of the heads, of extract. This possesses the virtues of opium in a very inferior degree; but it does not come to this country, unless when used to adulterate the genuine opium. A strong decoction of the dried heads, mixed with as much sugar as is sufficient to reduce it into the consistence of a syrup, becomes fit for keeping in a liquid form; and is the only officinal preparation of the poppy. It is, however, a very unequal preparation, as the real quantity of opium

it contains is very uncertain, and by no means equal to syrup; to which a certain quantity of solution of opium is added.

The seeds of the poppy are simply emulsive, and contain none of the narcotic principle. They yield a considerable quantity of fixed oil by expression.

Two kinds of opium are found in commerce, distinguished by the names of Turkey and East-India opium.

Turkey opium is a solid compact substance, possessing a considerable degree of tenacity; when broken, having a shining fracture and uniform appearance; of a dark brown colour; when moistened, marking on paper a light brown interrupted streak, and becoming yellow when reduced to powder; scarcely colouring the saliva when chewed, exciting at first a nauseous bitter taste, which soon becomes acrid, with some degree of warmth; and having a peculiar heavy disagreeable smell. The best is in flat pieces, and besides the large leaves in which it is enveloped, is covered with the reddish capsules of a species of rumex, probably used in packing it. The round masses which have none of these capsules adhering to them, are evidently inferior in quality. It is bad if it be soft, or friable, mixed with any impurities, have an intensely dark or blackish colour, a weak or empyreumatic smell, a sweetish taste, or draw upon paper a brown continuous streak.

East-Indian opium has much less consistence, being sometimes not much thicker than tar, and always ductile. Its colour is much darker; its taste more nauseous, and less bitter; and, its smell rather empyreumatic. It is considerably cheaper than Turkish opium, and supposed of only half the strength. One eighth of the weight of the cakes is allowed for the enormous quantity of leaves with which they are enveloped. In the East Indies, when opium is not good enough to bring a certain price, it is destroyed under the inspection of officers.

Opium is not fusible, but is softened even by the heat of the fingers. It is highly inflammable. It is partially soluble, both in alcohol and in water. Neumann got from 1920 parts of opium, 1520 alcoholic, and afterwards 80 watery extract, 320 remaining undissolved; and inversely 1280 watery, and 200 alcoholic extract, the residuum being 440.

The solutions of opium are transparent, and have a brown or vinous colour. The watery solution is not decomposed by alcohol. A small quantity of matter, which, as far as my experiments go, is neither fusible nor remarkably inflammable, is separated from the alcoholic solution by water. I have also observed that the watery solution of opium or the alcoholic, after it has been precipitated by water, does not redden vegetable blues, is not precipitated by acids or alkalies, but is precipitated copiously by carbonate of potash, muriate and super-nitrate of mercury, oxymuriate of tin, sulphate

of copper, sulphate of zinc, acetate of lead, nitrate of silver, and red sulphate of iron. The precipitate in the last case was dirty brown, not resembling those by alkaline or astringent substances. The solutions of opium, especially the watery, are also copiously precipitated by infusion of galls. This precipitate seems to resemble that produced by cinchonin, and to be different from that produced by gelatin.

Opium imparts its narcotic virtues by distillation to alcohol and to water, and they are also diminished, or entirely dissipated, by long boiling, roasting, or great age. The part of opium which is insoluble either in water or in alcohol, is albumen, according to Gren; caoutchouc, according to Buchholtz; a virulent glutinous substance, according to Joffe; and Proust says it contains wax. From experiments made some years ago, I concluded that it was perfectly similar to the gluten of wheat flour, or fibrine. Long ago it was proposed to separate the resinous parts of opium by the same process that the fibrine of wheat flour is obtained. The fact is, that if Turkey opium be kneaded in a large quantity of water, the soluble parts are removed, and there remains in the hand an adhesive plastic mass, of a paler colour, not fusible, but becoming ductile when immersed in hot water, inflammable, imparting some colour to alcohol, but not soluble in it. East-India opium, treated in the same way, is entirely dissolved or diffused in the water, and leaves no plastic mass in the hand.

Upon the whole, it appears that the active constituent of opium, though not perfectly understood, is of a volatile nature, but somewhat fixed by its combination with the other constituents; that it is soluble both in water and in alcohol; that it is dissipated in the processes recommended for purifying opium by solution and evaporation; and that the attempts, made by some pharmacutists, to obtain a preparation of opium, which should possess only its sedative, without its narcotic, effects, only succeeded in so far as they diminished its activity.

By evaporating a watery solution of opium to the consistence of a syrup, Derosne obtained a precipitate, which was increased by diluting it with water. He dissolved this in hot alcohol, from which it again separated on cooling. When purified by repeated solutions it crystallized in rectangular prisms, with rhomboidal bases, had no taste or smell, was insoluble in cold water, and soluble in 400 parts of boiling water, did not affect vegetable blues, was soluble in 24 parts boiling, and 110 cold, alcohol; soluble in hot ether and volatile oils, and separated from them as they cooled; very soluble in all acids, and highly narcotic. These observations are curious, and deserve to be confirmed.

Medical use.—The action of opium on the living system, has

been the subject of the keenest controversy. Some have asserted that it is a direct sedative, and that it produces no stimulant effects whatever, while others have asserted as strongly, that it is a powerful, and highly diffusible, stimulus, and that the sedative effects, which it undeniably produces, are merely the consequence of the previous excitement. The truth appears to be that opium is capable of producing a certain degree of excitement, while the sedative effects which always succeed, are incomparably greater than could be produced by the preceding excitement. The stimulant effects are most apparent from small doses. These increase the energy of the mind, the frequency of the pulse, and the heat of the body, excite thirst, render the mouth dry and parched, and diminish all the secretions and excretions, except the cuticular discharge, which they increase. These effects are succeeded by languor and lassitude. In larger doses, the stimulant effects are not so apparent, but the power of all stimulating causes, such as pain and fear, of making impressions on either the body or mind, is remarkably diminished, and confusion of head, vertigo, and sleep, are produced. In excessive doses it proves a violent narcotic poison, producing head-ach, vertigo, delirium, and convulsions, accompanied with a very slow pulse, stertorous breathing, and a remarkable degree of insensibility or stupor, terminated by apoplectic death. In one case where I inspected the body after death, the inner membrane of the stomach was remarkably corrugated, and with some inflammation; but as large doses of sulphate of zinc, and of flour of mustard had been also taken, no inference can be drawn from these appearances. The bad effects of an over-dose of opium are often prevented by vomiting when it is excited, and they are best counteracted by making the patient drink freely of acids and coffee, and not permitting him to yield to his desire of sleeping. By habit, the effects of opium on the body are remarkably diminished. There have been instances of four grains proving fatal to adults, while others have been known to consume as many drachms daily. The habitual use of opium produces the same effects with habitual dram drinking, tremors, paralysis, stupidity, and general emaciation, and like it can scarcely ever be relinquished.

In disease, it is chiefly employed to mitigate pain, diminish morbid sensibility, procure sleep, allay inordinate actions, and to check diarrhoeas and other excessive discharges. It is contraindicated in gastric affections, plethora, highly inflammatory state of the body, and determination of the blood to particular viscera.

In intermittents, it is said to have been used with good effect in every stage. Given even in the hot stage, it has been observed to allay the heat, thirst, headach, and delirium, to induce sweat and

sleep, to cure the disease with less bark, and without leaving abdominal obstructions or dropsy.

In fevers of the typhoid type, accompanied with watchfulness or diarrhoea, it is extremely useful; but when not indicated by particular symptoms, it does harm, by augmenting thirst, and producing constipation. Especially when combined with calomel, it has lately been much employed in inflammations from local causes, such as wounds, fractures, burns, absorption of morbid poisons, as in swelled testicle, &c. and even in active inflammations, accompanied with watchfulness, pain, and spasm, after blood-letting.

In small-pox, when the convulsions before eruption are frequent and considerable, or when the accompanying fever is of the typhoid type, opium is liberally used. It is likewise given from the fifth day onwards; and is found to allay the pain of suppuration, to promote the pytalism, and to be otherwise useful.

In dysentery, after the use of gentle laxatives, or along with them, opium, independently of any effect it may have on the fever, is of consequence in allaying the tormina and tenesmus, and in obviating that laxity of bowels which so frequently remains after that disease.

In diarrhoea, the disease itself generally carries off any acrimony that may be a cause, and then opium is used with great effect. Even in the worst symptomatic cases, it seldom fails to alleviate.

In cholera and pyrosis, it is almost the only thing trusted to.

In colic, it is employed with laxatives; and often prevents ileus and inflammation, by relieving the spasm. Even in ileus it is sometimes used to allay the vomiting, the spasms, and the pain.

It is given to allay the pain and favour the descent of calculi, and to give relief in jaundice and dysuria proceeding from spasm.

It is of acknowledged use in the different species of tetanus; affords relief to the various spasmodic symptoms of dyspepsia, hysteria, hypochondriasis, asthma, rabies canina, &c. and has been found useful in some kinds of epilepsy.

In syphilis it is only useful in combating symptoms, and in counteracting the effects resulting from the improper use of mercury, for it possesses no power of overcoming the venereal virus.

It is found useful in certain cases of threatened abortion and lingering delivery, in convulsions during parturition, and in the after pains and excessive flooding.

The administration of opium to the unaccustomed, is sometimes very difficult. The requisite quantity is wonderfully different in different persons, and in different states of the same person. A quarter of a grain will in one adult produce effects which ten times the quantity will not do in another; and a dose

that might prove fatal in cholera or colic, would not be perceptible in many cases of tetanus or mania. When given in too small a dose, it is apt to produce disturbed sleep, and other disagreeable consequences; but sometimes a small dose has the desired effect, while a larger one gives rise to vertigo and delirium, and with some constitutions it does not agree in any dose or form. Its stimulant effects are most certainly produced by the repetition of small doses, its anodyne by the giving of a full dose at once. In some it seems not to have its proper effect till after a considerable time. The operation of a moderate dose is supposed to last in general about eight hours from the time of taking it.

Externally, opium is used to diminish pain, and to remove spasmodic affections. It is found particularly serviceable in chronic ophthalmia, when accompanied with morbidly increased sensibility.

Opium may be exhibited,

1. In substance, made up in the form of a pill, troche, or electuary. Its most efficient form.
2. Dissolved in diluted alcohol, or white wine.
3. Dissolved in water or watery fluids. Very perishable.
4. Dried and reduced to powder.

It is often given in combination with aromatics, astringents, emetics, bitters, camphor, soap, distilled waters, mucilage, syrups, acids, carbonate of ammonia, ether, acetate of lead, tartrate of antimony and potash, and unctuous substances. Some of these are certainly unchemical mixtures, for I find by experiment that the solutions of opium are copiously precipitated by astringents, the alkaline carbonates, and all the metallic salts.

Off. prep.—*Pil. Lond. Ed.* Opium purificat. *Lond. Dub.* Extract. opii, *Ed. Lond.* Troch. glycyrr. cum opio, *Ed. Lond.* Elect. five Confect. opiat. *Ed. Lond.* Elect. catechu, *Ed. Dub.* Tinctura opii, *Ed. Lond. Dub.* Tinct. opii camph. *Lond. Dub.* Tinct. op. ammoniat. *Ed.* Syr. opii, *Dub.* Syr. papav. somniferi, *Ed. Lond.* Pulv. opiat. *Ed.* Pulv. ipecac. et opii, *Ed.*

PARIETARIA OFFICINALIS. *Parietaria. Lond.*

Polygamia Monœcia.—*Nat. ord. Scabridæ.*

Pellitory of the wall.

Off.—*Herba.* The herb.

THIS is a small plant growing upon old walls; of an herbaceous sub-saline taste, without any smell.

PASTINACA OPOPONAX. *Opoponax. Lond.*

Willd. g. 558, sp. 3. Pentandria Digynia.—Nat. ord. *Umbellatæ.*

Opoponax.

Off.—Gummi-refina. A gum-refin.

THIS plant is perennial, and grows wild in the south of Europe; but the gum-refin which is said to be obtained by wounding the stalk or root, is brought from the Levant and East Indies, sometimes in round drops or tears, but more commonly in irregular lumps, of a reddish yellow colour on the outside with specks of white, inwardly of a paler colour, and frequently variegated with large white pieces. It has a peculiar strong smell, and a bitter, acrid, somewhat nauseous, taste.

Neumann got from 480 parts, 166 alcoholic, and afterwards 180 watery extract; and inversely 226 watery, and 60 alcoholic. Both the water and alcohol distilled from it were impregnated with its flavour. It forms a milky solution with water, and yields a little essential oil on distillation. It is supposed to be emenagogue, but is rarely used.

Off. prep.—Pil. galb. comp.

PHASIANUS GALLUS. *Lond. Dub.*

Cl. Aves. Ord. Gallina.

The dung-hill fowl.

Off.—Ovum, ejusque putamen. The egg, and egg-shell.

FROM what country this useful bird originally came, is not ascertained. It is now domesticated almost everywhere, and furnishes one of the most wholesome and delicate articles of food.

The egg only is officinal. The shell consists principally of carbonate of lime, with a small quantity of phosphate of lime and animal matter. When burnt, the animal matter and carbonic acid are destroyed, and we obtain a lime, mixed with a little phosphate of lime.

The contents of the egg consist of two substances, the white, and the yolk. The white is albumen, combined with a little soda and sulphur. The yolk is also albuminous, but contains moreover a bland oil, and some colouring matter. The latter is sometimes used in pharmacy for suspending oily and resinous substances in water. The former is used for clarification.

Off. prep.—Ovorum testæ ppt. *Dub.* Cataplasin alumin. *Lond. Dub.*

PHYSETER MACROCEPHALUS. *Ed. Lond. Dub.*

Cl. Mammalia. Ord. Cetacea.

Spermaceti-whale.

Off.—Materia in cranio reperta, *Spermaceti dicta.* The fuet. *Spermaceti.*

THE spermaceti whale is characterized by his enormous head, great part of which is occupied by a triangular cavity of bone, covered only by the common integuments. In the living animal this cavity is filled with a white, fluid, oily, substance, amounting sometimes to many tons in weight. On the death of the whale, it congeals into a white unctuous mass, from which a considerable quantity of very pure whale oil is obtained by expression. The residuum, afterwards freed from impurities, by washing with water, melting, straining, expression through linen bags, and, lastly, washing in a weak ley of potash, is the peculiar substance well known by the name of Spermaceti. It is also contained in solution in the common whale and other fish-oils; for it is often found deposited, by a species of crystallization, in the reservoirs containing them.

The chemical properties of spermaceti have been already noticed. As a medicine, for internal use, it agrees with the fixed vegetable oils; and in the composition of ointments, &c. its place may be very well supplied by a mixture of oil and wax.

Off. prep.—Ungt. sperm. ceti, *Lond. Dub.* Ungt. ceræ, *Lond. Dub.* Cerat. simp. *Ed. Lond. Dub.*

PIMPINELLA ANISUM. *Ed. Anisum. Lond. Dub.*

Willd. g. 562, sp. 8. Pentandria Digynia.—Nat. ord. *Umbellate.*

Anise.

Off.—Semen. The seed.

ANISE is an annual umbelliferous plant, growing naturally in Crete, Syria, and other places of the east. It is cultivated in some parts of France, Germany, and Spain, and may be raised also in England: the seeds brought from Spain, which are smaller than the others, are preferred.

Aniseeds have an aromatic smell, and a pleasant warm taste, accompanied with a degree of sweetness. Water extracts very little of their flavour; rectified spirit the whole.

Off. prep.—Ol. volat. *Ed. Lond. Dub.* Spirit. *Lond.*

PINUS.

Monœcia Adelpbia.—Nat. ord. *Coniferae.*

Sp. PINUS ABIES.

a. Resina sponte concreta, vulgo Pix Burgundica, Ed. Dub.

b. Resina alba, Dub. Thus, Lond.

Common spruce-fir. Burgundy-pitch. Common frankincense.

Sp. PINUS BALSAMEA. *Resina liquida, vulgo Balsamum Canadense. Ed. Lond. Dub.*

Hemlock-fir, Balsam of Canada,

Sp. PINUS LARIX.

a. *Resina liquida, vulgo Terebinthina Veneta. Ed. Dub.*

b. *Oleum volatile, vulgo Oleum terebinthinæ. Ed.*

The larch. Venice turpentine. Oil of turpentine.

Sp. PINUS SYLVESTRIS.

a. *Resina empyreumatica Pix liquida dicta. Ed. Dub.*

b. *Terebinthina vulgaris. Dub.*

c. *Resina alba. Dub.*

Scotch fir. Tar. Common turpentine. Common frankincense.

THESE different species of fir are all natives of sandy situations. The last only grows wild in this country. They all abound in every part with a resinous juice, which possesses the same general qualities, but presents some varieties, according to the nature of the species and mode of preparation.

We may arrange the products,

1. Into those which exude spontaneously.
2. Into those procured by wounding the tree.
3. Into those procured by decoction. And,
4. Into those which are procured by the action of fire.

The pinus larix exudes a species of manna, called Briançon Manna, but which is not used; as, besides the saccharine matter, it evidently contains turpentine.

RESINA PINI SPONTE CONCRETA.

Concrete resin of pine.

From the pinus abies, and perhaps from the pinus sylvestris, in warm seasons and climates, a resinous juice exudes spontaneously, which hardens into tears by exposure to the air. It is the *Thus* of the London Pharmacopœia, the *Resina alba* of the Dublin, or common frankincense. It is a solid brittle resin, brought to us in little globes, or masses, of a brownish or yellowish colour on the outside; internally whitish, or variegated with whitish specks, of a bitterish, acrid, not agreeable taste, without any considerable smell.

Off. prep.—Emplastr. lad. comp. *Lond.* Empl. thuris comp. *Lond.* Empl. lith. comp. *Lond.*

RESINA PINI ABIETIS. Ed. Pix Burgundica. Dub.

Burgundy pitch.

REAL Burgundy pitch is collected, according to Tingry, from the pinus picea, or spruce fir tree. The resinous juice which exudes from this species is less fluid, and less transparent, than the proper turpentine. It is collected by the peasants, strained

through cloths, and put into barrels. If its consistence be too thick, it is mixed over the fire with a little turpentine, and oil of turpentine. A simple mixture of gallipot and barras, made without heat, is often sold under the name of Burgundy pitch, but the mass resulting from this combination soon becomes friable. It has neither the unctuousity, visciditv, tenacitv, nor smell, which distinguish the real kind.

Although gallipot contains essential oil, the quantity is so small that it is never distilled from it. It is purified by melting it with a very gentle fire, and filtrating it. By this process it still contains essential oil, and is often sold by the name of Burgundy pitch. If boiling water be added to it after it is strained, but while it is still fluid, and they be agitated together till the mass cools, we have a yellow resin, which, from still containing some essential oil, is preferred to that prepared by a similar process from the residuum of the distillation of turpentine.

Off. prep.—Emplast. picis Burgund. *Ed. Lond. Dub.* Emplast. mel. vesic. comp. *Ed.*

RESINÆ LIQUIDÆ PINI, vulgo *Terebinthinae*.

Liquid resin of pine, commonly called Turpentine.

To obtain the products of the second kind, a series of wounds are made through the bark into the wood, beginning at the bottom, and rising gradually upwards, until a stripe of the bark, about nine feet high, be removed, which is commonly effected in about four years. The same operation is then repeated on the opposite side. The operation is then recommenced close to the edge of the former wound, which by this time is nearly closed. A tree worked in this manner will survive and furnish turpentine for near a century. The juice which flows from these wounds during summer, is collected in a small cavity, formed in the earth at the bottom of the incisions, from which it is occasionally removed into proper reservoirs previous to its purification. As the trees exude very little juice during cold weather, no new incisions are made in winter; but the old ones get covered with a soft resinous crust, called *barras*, when it is impure, and mixed with bits of bark, dust and sand; *gallipot*, when collected with more care; or white incense, when it is allowed to remain so long exposed that it becomes resinified, which is scraped off, and also collected for subsequent purification.

All these products are purified by liquefaction and filtration. They consist almost entirely of an essential oil and a resin, and differ only in the proportions, the turpentine containing most oil, and the gallipot most resin.

Turpentines have different appellations, chiefly according to the country from which they are procured.

Balsam of Canada, from the *Pinus balsamea*, et *Pinus Canadensis*.

Resina liquida. Ed. *Balsamum Canadense*. Lond. Dub.

Cyprian turpentine, from the *Pistacia terebinthus*.

Terebinthina Chia. Lond.

Straßburgh turpentine, from the *Pinus picea*.

Venice turpentine, from the *Pinus larix*.

Resina liquida. Ed. *Terebinthina Veneta*. Lond.

Common turpentine, from the *Pinus sylvestris*.

Terebinthina vulgaris. Lond. Dub.

Hungarian balsam, from the *Pinus sylvestris* var. *Mugbos*.

Carpatian balsam, from the *Pinus cembra*.

None of these are properly balsams; which term is now used to express those oily resinous substances only which contain benzoic acid. The Edinburgh college have denominated them liquid resins, the most correct appellation they have yet received.

All these species of turpentine possess the same general properties. They are more or less fluid, with different degrees of transparency; of a whitish or yellowish colour; a penetrating smell, and a warm, pungent, bitterish taste. They are entirely soluble in alcohol, combine with fixed oil, and impart their flavour to water, but are not soluble in it. They are decomposed by a moderate heat, being separated into an essential oil and a resin, and are exceedingly inflammable, burning with a large white flame, and much smoke.

Each species has some peculiarities. The Canadian is reckoned the best, and next to it the Chian. They are more transparent, and have a more agreeable flavour than the other sorts. The common turpentine, as being the most offensive, is rarely given internally; its principal use is in plasters and ointments among farriers, and for the distillation of the essential oil.

Medical use.—Taken internally, they are active stimulants, increase the secretion of urine, to which they give the smell of violets, even though applied only externally, and open the bowels. In all cases accompanied with inflammation, they ought to be abstained from, as this symptom is increased, and not unfrequently occasioned, by them. They are principally recommended in gleets, the fluor albus, and the like. Their dose is from a scruple to a drachm and a half. They are most commodiously taken in the form of a bolus, or blended with watery liquors, by the mediation of the yolk of an egg or mucilage. They may also be given in the form of electuary, mixed with twice their weight of honey, and in the dose of a drachm of the compound twice or thrice a-day, or of clyster, half an ounce being well triturated with the yolk of an egg, and mixed with half a pound of gruel or decoction of chamomile.

Off. prep.—Ol. volat. *Lond. Dub.* Ungt. infus. mel vesic. *Ed.* Emplast. mel vesic. comp. *Ed.* Empl. litharg. comp. *Lond.* Ungt. elemi, *Lond. Dub.*

OLEUM PINI VOLATILE. *Ed.* *Oleum Terebinthina.* *Lond. Dub.*

Oil of turpentine.

IN the Edinburgh Pharmacopœia this essential oil is officinal: by the other colleges directions are given for their preparation.

It is lighter than water, transparent, limpid, and volatile. It has a hot pungent taste, and a penetrating smell; is highly inflammable, and possesses all the other properties of essential oils.

It is remarkably difficult of solution in alcohol, although turpentine itself dissolves easily. One part of the volatile oil is indeed apparently taken up by seven of alcohol, but on standing, the greatest part of the oil falls to the bottom, a much larger quantity being necessary to retain it in solution.

Med. use.—As a medicine, it is highly stimulating and penetrating. Internally it acts as a diuretic or sudorific in very small doses. It has, however, been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronic rheumatism, particularly in those modifications of it which are styled *sciatica* and *lumbago*. But it has not been often successful, and sometimes has had the effect of inducing bloody urine.

Externally, it often produces excellent effects as a discutient in indolent tumours; as a stimulus in paralysis of the extremities, and in bruises; as an antispasmodic, and as a styptic, when applied as hot as the patient can bear it, on compresses directly to the bleeding mouths of the vessels.

Off. prep.—Ol. tereb. puriss. *Ed. Lond. Dub.*

EXTRACTUM PINI.

Extract of pine.

A fluid extract, prepared by decoction from the twigs of the *pinus sylvestris*, is the well-known essence of spruce, which, fermented with molasses, forms the fashionable beverage of Spruce beer.

RESINA EMPYREUMATICA PINI *Pix liquida dicta.* *Ed. Lond. Dub.*

Tar. Empyreumatic resin of pine.

THE last kind of products from the different species of fir are obtained by the action of fire. With this view, a conical cavity is dug out in the earth, communicating at the bottom with a reservoir. Billets or thin laths of wood are then placed, so as not only to fill the cavity, but to form a conical pile over it, which is

covered with turf, and kindled at the top. The admission of air is so regulated, that it burns from above downwards, with a slow and smothered combustion. The smoke and vapours formed are obliged to descend into the excavation in the ground, where they are condensed, and pass along with the matters liquefied into the receiver. This mixture is denominated Tar; and the wood itself is reduced to charcoal. By long boiling, tar is deprived of its volatile parts, and converted into pitch.

Tar is a mixture of resin, empyreumatic oil, charcoal, and acetic acid. Its colour is derived from the charcoal; and the other properties in which it differs from a common resin, depend on the presence of acetic acid and empyreumatic oil. The acid itself is not only soluble in water, but it also renders the empyreumatic oil soluble in larger quantities than it otherwise would be.

Medical use.—Tar-water is a heating diuretic and sudorific remedy; but by no means so powerful, or so generally admissible, as it was represented by Bishop Berkley. Tar is applied externally in tinea capitis, and some other cutaneous diseases.

Off. prep.—Ungt. picis, *Ed. Lond. Dub.*

But the most remarkable production of the pine tribe is that of a real gum, entirely soluble in water, from a tree so resinous as the *Pinus larix*. It is prepared in the Ural larch forests; and exudes, according to Professor Pallas, from the interior parts of the wood when it is burning.

PIPER.

Willd. g. 74. *Diandria Trigynia*.—Nat. ord. *Piperitæ*.

Sp. 1. PIPER NIGRUM. Bacca, Lond. Fructus. Ed. Semina. Dub.

Black pepper.

Off.—*Bacca.* The berry.

THE black pepper is the fruit of a shrubby creeping plant, which grows wild in the East Indies, and is cultivated in Java and Malabar, by which means the fruit is much improved. The berries are gathered before they are ripe, and are dried in the sun. They become black and corrugated on the surface; their taste is hot and fiery, and their smell slightly aromatic.

Neumann got from 7680 parts 4800 watery, and afterwards 180 alcoholic extract; and inversely, 1080 alcoholic, and 3640 watery. The principle on which its pungency depends, was soluble both in water and in alcohol, and was not volatile, for 7680 grains furnished about 150 of a very bland volatile oil. From this analysis Dr. Thomson differs considerably. By macerating it in alcohol, and distilling the tincture, he got a green volatile oil, having the whole flavour and pungency of the pepper. Be-

sides this essential principle, he found it to contain an extractive and starch.

White pepper is the fruit of the same plant, gathered after it is fully ripe, and freed of its external coat by maceration in water. It is smooth on the surface, and less pungent than the black pepper.

Off. prep.—Emplast. mel vesic. comp. *Ed.*

Sp. 3. PIPER CUBEBA. Cubeba. Lond.

Cubeba.

CUBEBS are a fruit brought from Java. This fruit has a great resemblance to pepper. The principal difference distinguishable by the eye is, that each cubeb is furnished with a long slender stalk, whence they are called by some *piper caudatum*. In aromatic warmth and pungency, cubebs are far inferior to pepper.

Neumann got from 960 grains, 310 alcoholic, and 272 watery extract; and inversely, 380 watery, and 61 alcoholic. It also furnishes some volatile oil.

Sp. 12. PIPER LONGUM. Lond. Ed. Dub.

Long pepper.

Off.—Fructus, semina. The fruit and seeds.

THE plant which bears the long pepper is also a sarmentaceous climber. The berries are small round grains, disposed spirally in a long cylindrical head. They are gathered before they are ripe, and dried, and are the hottest of all the peppers.

The warmth and pungency of these spices reside entirely in a resin; their aromatic odour is an essential oil. In medicine, they are sometimes employed as acrid stimulants; but their chief use is in cookery, as condiments.

Off. prep.—Tinct. cin. comp. *Ed. Lond. Dub.* Confect. opiat. *Lond.* Pulv. aromat. *Lond. Dub.* Pulv. cret. comp. *Lond.*

PISTACIA.

Dioecia Pentandria.—Nat. ord. *Amentaceæ.*

Sp. PISTACIA TEREBINTHUS. Terebinthina Chia. Lond.

Chian turpentine.

THE tree which yields this turpentine grows in India, the north of Africa, and south of Europe; but the turpentine is principally collected in the islands of Chios and Cyprus, by wounding the tree. It does not differ in any thing material, except its price, from the other turpentines.—See PINUS.

Sp. PISTACIA LENTISCUS. Ed. Mastiche. Lond.

Mastich.

Off.—*Resina.* The resin.

THIS species is a native of the same countries with the former. It is obtained principally in the island of Chios, by making transverse incisions into the tree, and allowing the juice to harden. It is brought in small, yellowish, semi-transparent, brittle grains; of a smooth and shining fracture, softening when chewed, fusible, burning with a pleasant smell, insoluble in water, and partially soluble in alcohol and fixed oils. Neumann found that, during digestion with alcohol, a portion separates, insoluble in alcohol, though in appearance resinous, amounting to about one tenth of the mastich. This is probably the same with the substance found in Sandarach by Mr. Giese, and called Sandaracha by Dr. Thomson.

Its flavour is communicated to water. It is therefore a resin, combined with a little essential oil. It is principally used by the Turkish women as a masticatory, to preserve the teeth, and to give a pleasant smell to the breath.

PLUMBUM. *Ed. Lond.*

Lead.

THE general properties of lead have been already enumerated. Lead is found,

I. Oxidized :

1. Lead ochre of different colours.

II. Oxidized, and combined with acids.

2. Carbonated lead. White lead spar
3. Murio-carbonated.
4. Phosphated lead. Green lead ore.
5. Arseniated lead.
6. Arsenio-phosphated lead.
7. Molybdated lead.
8. Sulphated lead.

III. Sulphuretted :

9. Sulphuretted lead. Galena.
10. Sulphuretted oxide of lead.

Lead is obtained by various processes from these ores. In its metallic form it is scarcely an officinal article, as its different oxides are purchased from the manufacturers, and never prepared by the apothecary.

Lead admits of three states of oxidization, according to Dr. Thomson.

				LEAD.	OXYGEN.
Protoxide.	Yellow.	-	-	90.5	9.5
Deutoxide.	Red.	-	-	88.	12.
Peroxide.	Brown.	-	-	80.	20.

Med. use.—Its effects on the body are emaciation, violent colics, paralysis, tremors, and contractions of the limbs; and as they generally come on gradually, the cause is sometimes overlooked till it be too late. Poisoning from lead is never intentional, but only accidental, either from liquors becoming impregnated with lead, by being improperly kept in vessels lined or glazed with lead, or to which lead has been criminally added, to correct its acidity; or among manufacturers who work much with lead, as painters and plumbers, and who are not sufficiently attentive to avoid swallowing any of it.

The presence of lead in any suspected liquor is detected by the hydro-sulphuret of potash, which forms with it a brown precipitate, not soluble in diluted muriatic acid; and still more certainly, by evaporating a portion of it to dryness, and exposing the extract to a heat sufficient to reduce the lead.

OXIDUM PLUMBI ALBUM. *Ed. Cerussa. Lond. Dub. Carbonas Plumbi.*

White oxide of lead. Ceruse. White lead.

THIS substance is prepared by exposing lead to the vapour of vinegar. To accelerate the oxidizement, the lead is cast in thin plates, which are rolled up spirally. A number of these are placed perpendicularly on a support, over a flat vessel containing vinegar, which is converted into vapour by a gentle heat, such as that of dung. The plates become slowly covered with a white crust, which is in due time removed; and the remains of the plates are again exposed to the vapour of vinegar, until they be entirely corroded. Van Mons says, that if lead ashes be dissolved in diluted nitric acid, and precipitated by chalk in impalpable powder, the precipitate, when washed and dried, will be ceruse in its purest state.

White oxide of lead has a scaly or foliated texture, is brittle, friable, heavy, of a snowy whiteness, and a sweet taste. It is often adulterated with earthy substances, which may be discovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarser particles cannot be separated by means of a sieve, because its interstices soon get filled up. It can only be obtained in the state of a fine powder, by rubbing a loaf of ceruse on a sieve placed over a sheet of paper. It consists of 86 yellow oxide of lead, and 14 water; or if native, 84 and 16.

In pharmacy the white oxide of lead is used in the composition of ointments and plasters.

Off. prep.—*Acetis plumbi*, *Ed. Lond. Dub.* *Ungt. oxidi plumbi albi*, *Ed.* *Pulv. cerussæ comp.* *Lond.*

OXIDUM PLUMBI RUBRUM. *Ed. Minium. Lond.*

Red oxide of lead. Red lead.

THE preparation of red lead is so troublesome and tedious, that the preparation of it forms a distinct branch of business. The makers melt large quantities of lead at once, upon the bottom of a reverberatory furnace built for this purpose, and so contrived, that the flame acts upon a large surface of the metal, which is continually changed by the means of iron rakes drawn backwards and forwards, till the fluidity of the lead is destroyed; after which, the oxide is only now and then turned.

The red oxide of lead is obtained in the form of a very heavy powder, consisting of minute shining scales, of a bright scarlet, verging towards yellow, especially if triturated. It is sometimes adulterated with red oxide of iron, red bole, or powdered brick. These frauds are detected by the inferiority of colour, by mixing it with oil, and subjecting it to the test of reduction; and by its forming a black precipitate with tincture of galls, when dissolved in nitrous acid.

The red oxide of lead contains 88 lead and 12 oxygen. When red lead is treated with diluted nitrous acid, 76 parts are dissolved, and 24 of a flea-brown powder remain behind. This powder is the peroxide of lead, and contains 20 per cent. oxygen. It is only soluble in the hyper-oxy-muriatic acid. The 76 parts dissolved are yellow oxide.

OXIDUM PLUMBI SEMIVITREUM *Ed. Lithargyrus. Lond. Dub.*

Semi-vitrified oxide of lead. Litharge.

IF oxidized lead be urged with a hasty fire, it melts into the appearance of oil, and on cooling concretes into litharge. Greatest part of the litharge met with in the shops is produced in the purification of silver from lead, and the refining of gold and silver by means of this metal. According to the degree of fire and other circumstances, it proves of a pale or deep colour; the first has been commonly called Litharge of silver, the other, Litharge of gold. Litharge is a sub-carbonate of lead. It contains 96 yellow oxide, and 4 carbonic acid. It also frequently contains a little oxide of antimony.

The oxides of lead dissolve by heat in expressed oils; these mixtures are the basis of several officinal plasters and ointments.

Lead and its oxides, when undissolved, have no considerable effects as medicines. Dissolved in oils, they are supposed to be (when externally applied) anti-inflammatory and desiccative. Combined with vegetable acids, they are remarkably so; and taken internally, prove powerful, though dangerous styptics.

Off. prep.—Litharg. ppt. *Ed. Dub.* Aqua lith. acet. *Lond. Dub.* Emplast. *Ed. Lond. Dub.* Cerat. saponis, *Lond. Dub.*

POLYGALA SENEKA. *Ed. Seneka. Lond. Dub.*

Diadephia Oetandria.—Nat. ord. *Lomentaceæ.*

Seneka, or Rattlesnake Root.

Off.—Radix. The root.

SENEKA is a perennial plant, which grows wild in North America, particularly Virginia and Pennsylvania. This root is usually about the thickness of the little finger, variously bent and contorted, and appears as if composed of joints, whence it is supposed to resemble the tail of the animal whose name it bears; a kind of membranous margin runs on each side the whole length of the root.

The bark is the active part of the root. Its taste is at first acrid, afterwards very hot and pungent. It has no smell.

Its acrimony resides in a resin; for it is entirely extracted by alcohol; is precipitated by water; does not rise in distillation; and is not destroyed by keeping.

Medical use.—It is an active stimulus, and increases the force of the circulation, especially of the pulmonary vessels. It has therefore been found useful in typhoid inflammations of the lungs; but it is apt to disorder the stomach, and to induce diarrhoea. Dr. Brandreth of Liverpool has derived great benefit in some cases of lethargy from an extract of seneka combined with carbonate of ammonia.

Some have likewise employed this root in hydropic cases, and not without success. There are examples of its occasioning a plentiful evacuation by stool, urine, and perspiration; and by this means removing the disease, after the common diuretics and hydragogues had failed.

The Senegaro Indians are said to prevent the fatal effects of the bite of the rattlesnake, by giving it internally, and by applying it externally to the wound.

The usual dose of the powder is 30 grains or more.

Externally, it has been advantageously used as a stimulating gargle in croup.

Off. prep.—Decoct. *Ed.*

POLYGONUM BISTORTA. *Ed. Bistorta. Dub. Lond.*
Willd. g. 785, sp. 3. Oelandria Trigynia.—Nat. ord. *Oleraceæ*.
 Great bistort, or snakeweed.

Off.—Radix. The root.

THIS plant is perennial, and grows wild in moist meadows in several parts of Britain. The root is about the thickness of the little finger, of a blackish brown colour on the outside, and reddish within: it is writhed or bent vermicularly, whence the name of the plant, with a joint at each bending, and full of bushy fibres; the root of the species here mentioned has, for the most part, only one or two bendings, others have three or more. All the parts of bistort have a rough austere taste, particularly the root, which is one of the strongest of the vegetable astringents.

Medical use.—It is employed in hæmorrhagies and other fluxes, both internally and externally, where astringency is the only indication. To the sudorific, antipestilential, and antiseptic virtues attributed to it, it has no other claim than what it derives from its astringency.

POLYPODIUM FILIX MAS. *Ed. Filix. Lond. Filix Mas. Dub.*

Cryptogamia. Filices.—Nat. ord. *Filices*.

Male fern. Male polypody.

Off.—Radix. The root.

THIS fern is perennial, and is found in great abundance in our woods. The root consists of many egg-shaped knots, closely compressed together, forming a crooked mass, of a blackish colour, and covered with brown scales.

When chewed, its taste is somewhat mucilaginous and sweet, and afterwards slightly astringent and bitter. Its smell is also weak.

Med. use.—This root was used as an anthelmintic in the days of Dioscorides. It gradually became neglected; but its use was again revived at different times by Madame Nuffer, Herrenschwand, and others, who frequently succeeded in killing and expelling the tænia, both lata and cucurbitina, by the exhibition of secret remedies, of which the fern-powder was, or rather was supposed to be, the principal ingredient; for there is much reason to believe, that the active purgatives with which it was always combined, were really the remedies which effected the cure.

The same, or nearly a similar secret, has been bought by different potentates, and published for the benefit of those suffering under this obstinate disease.

The internal solid part of the root only is to be powdered, and the powder should have a reddish colour; and as the dose and exhibition of the remedy must be regulated according to the age, sex, and constitution of the patient, it must be given always under the direction of an experienced practitioner.

POTENTILLA REPTANS. *Pentaphyllum.* Lond
Willd. g. 1000, sp. 34. *Icosandria Polygamia.*—Nat. ord. *Senticoſæ.*

Common cinquefoil

Off.—Radix. The root.

THIS plant is perennial, and grows plentiful in hedges, and by road sides. The root is moderately astringent, and as such, is sometimes given internally in diarrhœas and other fluxes, and employed in gargarisms for strengthening the gums, &c. The cortical part of the root may be taken in substance, to the quantity of a drachm: the internal part is considerably weaker, and requires to be given in double the dose to produce the same effect.

PRUNUS.

Willd. g. 982. *Icosandria Monogynia.*—Nat. ord. *Pomaceæ.*

Sp. 29. **PRUNUS DOMESTICA.** Ed. Lond. Dub.

Plumb tree.

Off.—Fructus, *Prunum Gallicum* dictus. The dried fruit, called French prunes.

THIS tree is found wild in hedges in England, but has probably originated from the stones of the cultivated kinds being dropt there by accident. Great quantities of the dried fruit are imported from the continent, of which the French are reckoned the best.

Medical use.—They contain much mucilaginous and saccharine matter, and their medical effects are, to abate heat, and gently loosen the belly, which they perform by lubricating the passages, and softening the excrement. They are of considerable service in costiveness, accompanied with heat or irritation, which the more stimulating cathartics would tend to aggravate: where prunes are not of themselves sufficient, their action may be promoted by joining with them a little rhubarb or the like; to which may be added some carminative ingredient, to prevent their occasioning flatulency.

Off. prep.—Elect. sennæ, Ed. Lond. Dub.

Sp. 32. PRUNUS SPINOSA. *Prunus sylvestris. Lond.*

The floe.

Off.—Fructus. The fruit.

THE floe also grows wild in Britain. The fruit has a very astringent fourish taste. It contains malic acid. The inspissated juice of the unripe fruit is very astringent, and is called *Acacia Germanica*. An infusion of a handful of the flowers is a safe and easy purge. The powdered bark will sometimes cure agues.

Off. prep.—Conserva, *Lond.*

PTEROCARPUS.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Sp. PTEROCARPUS SANTALINUS. *Ed. Santalum rubrum. Lond. Dub.*

Red faunders.

Off.—Lignum. The wood.

THIS tree grows in the East Indies, and acquires a very large size. The wood is brought in large billets, of a compact texture, a dull red, almost blackish colour on the outside, and a deep brighter red within. It has no manifest smell, and little or no taste. It communicates a deep red to alcohol, but gives no tinge to aqueous liquors: a small quantity of the resin, extracted by means of spirit, tinges a large one of fresh spirit, of an elegant blood red. Neumann got from 960 grains 210 alcoholic, and afterwards 20 of watery extract; and inversely, 126 tough watery extract, and 120 alcoholic. According to the same chemist, it gives out its colouring matter to volatile oil of lavender, but not to volatile oil of turpentine. Is this difference to be ascribed to the camphor contained in the former?

Off. prep.—Tinct. lav. comp. *Ed. Lond. Dub.*

Sp. PTEROCARPUS DRACO. *Ed. Sanguis draconis. Lond.*

Dragons blood.

Off.—Resina. The resin.

THIS is also a very large tree. It is a native of South America, and the resin which exudes from incisions made in its bark used to be frequently sent from Carthage to Spain. It is however doubtful if the dragons blood of the shops be produced from this tree, as many others furnish a similar resin, as the *dracæna draco*, *dalbergia monetaria*, and especially the *calamus draco*, which probably furnishes all that is brought from the East Indies.

The best dragons blood is not in cakes, but is brought in small masses, of the size of a nutmeg, wrapt up in the dried leaves of

some kind of reed, breaks smooth, free from any visible impurities, of a dark-red colour, which changes, upon being powdered, into an elegant bright crimson. This drug, in substance, has no sensible smell or taste; when dissolved, it discovers some degree of warmth and pungency. It is fusible and inflammable, and totally soluble in alcohol, tinging a large quantity of the menstruum of a deep-red colour. It is likewise soluble in expressed oils, and gives them a red hue, less beautiful than that communicated by anchusa. It is not acted upon by water, but precipitated by it from its alcoholic solution. I find that it is soluble in nitrous acid and alkalies, and that it neither precipitates gelatin, nor affects the colour of the salts of iron. It therefore appears to be a pure resin without any astringency. I have been more particular in proving that this resin is not astringent, because both Mr. Murray and Dr. Thomson have adopted Mr. Proust's account of it. But the substance examined by Mr. Proust could not be the resin known in this country by the name of Dragons blood, as it was as soluble in water as in alcohol. Dr. Fothergill, who first described kino, received it as the finest dragons blood. Mr. Proust must have been misled by some similar misinformation, as the characters of his *sang dracon* correspond with those of kino.

Off. prep.—Emp. thuris comp.

PUNICA GRANATUM. *Ed. Granatum. Lond. Dub.*

Willd. g. 980, sp. 1. Icosandria Monogynia.—Nat. ord. *Pomaceae.*

Pomegranate.

Off.—Fructus cortex, flos plenum, vulgo Balaustium. The outer rind of the fruit. The double flowers, called Balaustine.

THE pomegranate is a low tree, or rather shrub, growing wild in Italy and other countries in the south of Europe. It is sometimes met with in our gardens; but the fruit, for which it is chiefly valued, rarely comes to perfection. This fruit has the general qualities of the other sweet summer fruits, allaying heat, quenching thirst, and gently loosening the belly. The rind is a strong astringent, striking a permanent blue with sulphate of iron, and as such is occasionally made use of. The flowers are of an elegant red colour, in appearance resembling a dried red rose. Their taste is bitterish and astringent. They are recommended in diarrhoeas, dysenteries, and other cases where astringent medicines are proper.

PYRUS CYDONIA. *Cydonia Malus. Lond.*

Willd. g. 992, sp. 17. Icosandria Pentagynia.—Nat. ord. *Pomaceae.*

The quince.

ff.—Fructus, ejusque semen. The fruit and seeds.

THE quince is originally a native of Crete, but ripens its fruit perfectly in England.

Quinces have a very austere acid taste: taken in small quantity, they are supposed to restrain vomiting and alvine fluxes; and more liberally, to loosen the belly. The seeds abound with a mucilaginous substance, of no particular taste, which they readily impart to watery liquors; an ounce will render three pints of water thick and ropy like the white of an egg. They will not, however, supply the place of gum-arabic, because their mucilage spoils very quickly, and is precipitated by acids.

Off. prep.—Mucilago, *Lond.*

QUASSA A.

Willd. g. 849. *Decandria Monogynia.*—*Nat. ord. Gruinales.*

Sp. 2. QUASSIA SIMARUBA. Ed. Simarouba. Lond. Dub.

Mountain or bitter damson.

Off.—Cortex. The bark.

THIS tree grows in Guiana and in Jamaica. The simarouba of the shops is the bark of the root of this tree, and not of the quassia amara, as stated by the Dublin college. It is brought to us in pieces some feet long, and some inches broad, folded lengthwise. It is light, fibrous, very tough; of a pale yellow on the inside; darker coloured, rough, scaly, and warted on the outside; has little smell, and a bitter, not disagreeable, taste. It gives out its bitterness both to alcohol and water.

Med. use.—It has been much celebrated in obstinate diarrhoea, dysentery, anorexia, indigestion, lenteria, and intermittent fevers.

It is given in powder, in doses of half a drachm, or a whole drachm; but it is too bulky, and very difficultly pulverizable. It is best exhibited in decoction. Two drachms of the bark may be boiled in two pounds of water to one, and the decoction drunk in cupfuls in the course of the day.

Sp. 3. QUASSIA EXCELSA. Ed. Quassia. Lond.

Quassia.

Off.—Lignum, cortex, radix. The wood, bark, and root.

THIS tree grows in Jamaica, and in the Caribæan islands. The quassia of the shops is the wood of its root, and not of the quassia amara, which is a very rare tree, but surpasses all others in bitterness.

This root is about the thickness of a man's arm: its wood is

whitish, becoming yellowish by exposure to the air. It has a thin, grey, fissured, brittle bark, which is deemed, in Surinam, more powerful than the wood. Quassia has no sensible odour, but is one of the most intense, durable, pure bitters known. Its infusion, decoction, and tincture are almost equally bitter and yellowish, and are not blackened by chalybeates. The properties of the extract of quassia have been detailed by Dr. Thomson, under the title of the bitter principle.

Medical use.—It is a very pure and simple bitter, and may be given in all cases where bitters are proper. It has been exhibited in intermittent and bilious fevers, in stomachic complaints, in lenteria, in cachexy, dropsies, leucorrhœa, and gout. It is much used in this country to give the bitterness to malt liquors, though it subjects those brewers who employ it to a very heavy penalty.

It can scarcely be reduced to a sufficiently fine powder to be given in substance, and is therefore generally given in the form of infusion, decoction, or extract.

QUERCUS.

Monoecia Polyandria.—Nat. ord. *Amentacea*,

Sp. QUERCUS ROBUR. *Ed.* *Quercus.* *Lond.* *Dub.*
Oak.

Off.—Cortex. The bark.

THE oak grows wild in Britain. The superior excellence of its wood for ship-building has rendered its cultivation an object of national concern. Its saw-dust is an useful dye-stuff, and its bark is the principle article used in tanning.

Med. use.—The bark is a strong astringent, and is recommended in hæmorrhagies, alvine fluxes, and other preternatural or immoderate secretions. In these it is sometimes attended with good effects. But it is by no means capable of being employed as a substitute, in every instance, for Peruvian bark, as some have asserted; and indeed it is so difficultly reduced to a sufficiently fine powder, that it can scarcely be given internally in substance.

Off. prep.—Extract. *Dub.*

Sp. QUERCUS CERRIS. *Ed.* *Lond.* *Dub.*
Oriental oak.

Off.—Cynipis nidus, *Galla dictus.* The nest of the cynips quercifolii, called Gall nuts.

THIS species of oak is a native of the Levant, and of the warmer countries of Europe.

The cynips quercifolii, a hymenopterous insect, deposits its

eggs in the leaves and other tender parts of the tree. Around each puncture an excrescence is presently formed, within which the egg is hatched, and the insect passes through all the stages of its metamorphosis, until it becomes a perfect insect, when it eats its way out of its prison. These excrescences are called galls, or gall nuts. They are of different sizes, smooth or knotty on the surface, of a whitish, reddish, or blackish colour, and generally penetrated with a small hole. Internally they consist of a spongy, but hard, more or less brown substance, and they have a very rough astringent taste. Good galls are of a blackish-grey, or yellow colour, heavy, and tuberculated on the surface. They are the most powerful astringents we possess; and, since the discovery of the tanning principle by Mr. Seguin, have very much engaged the attention of chemists. Neumann got from 960 grains of coarsely powdered galls 840 watery extract, and afterwards only 4 alcoholic; and inversely, 760 alcoholic, and 80 watery. But the most accurate analysis is that of Mr. Davy, who found that 500 grains of good Aleppo galls gave, by lixiviating them until their soluble matters were taken up, and evaporating the solution slowly, 185 grains of solid matter, which, when examined by analysis, appeared to consist of,

Tannin,	-	-	-	130
Mucilage, and matter rendered insoluble by evaporation,	-	-	-	12
Gallic acid, and a little extractive matter,				31
Remainder calcareous earth and saline matter,				12

From my experiments, I am disposed to think that Mr. Davy has under-rated the tannin of nut-galls; for by simple repeated infusions in hot water, the residuum of 500 grains in one experiment amounted only to 158, and in another only to 136. The quantity of tannin estimated in Mr. Davy's way amounted, in the first to 221 grains, and in the second to 256. The great difference in these results from Mr. Davy's must be entirely ascribed to some differences in the galls themselves, or in the mode of operation. A saturated decoction of galls, in cooling, deposits a copious pale yellow precipitate, which seems to be purer tannin than can be got by any other process.

Medical use.—An infusion or decoction of galls may be used with advantage as an astringent gargle; and an ointment of one part of finely powdered galls to eight of any simple ointment is applied with success in hæmorrhoidal affections.

RESINA PINI. *Ed. Resina ex variis pinis oleo volatile privata. Resina flava. Lond. Dub.*

Yellow rosin. Baked turpentine.

THE proper turpentine contains a large proportion of volatile oil, which is often separated from them by distillation.

The residuum of the distillation gets different names, according to some peculiarities in its treatment. When the distillation is performed without addition, and continued until the whole essential oil be driven off, and there appear some traces of empyreuma, the residuum is Fiddlers rosin, or Colophony; but if, while the mass is still fluid, a quantity of water be added, and thoroughly blended with the resin by long and constant agitation, it is then called Yellow rosin.

At Queensferry, in this neighbourhood, there is a considerable turpentine work. The turpentine used comes from America. The under part of the cake of the residuum of the distillation resembles fiddlers rosin, the action of the fire having entirely expelled the water and volatile oil, and rendered it slightly empyreumatic and transparent, while the upper part, from retaining some water, is opaque and yellow.

Off. prep.—Ungt. resinos, *Ed. Lond. Dub.* Emplast. simp. *Ed.* Emp. ceræ, *Lond. Dub.* Emp. picis Burgund. *Lond. Dub.* Ungt. inf. mel vesic. *Ed.* Emp. mel vesic. *Ed.* Emp. resinos, *Ed.* Emp. lith. cum resina, *Lond.* Emp. hydrarg. *Ed.* Emp. oxidi ferri rubri, *Ed.*

RHAMNUS CATHARTICUS. *Ed. Spina Cervina. Lond. Willd. g. 405, sp. 1. Pentandria Monogynia.*—Nat. ord. *Dumosa.*

Purging buckthorn.

Off.—Baccarum succus. The berry. The juice of the berries.

THIS tree, or bush, is common in hedges: it flowers in June, and ripens its fruit in September or the beginning of October. In our markets, the fruit of some other trees, as the blackberry bearing alder, and the dogberry tree, have of late been frequently mixed with, or substituted for, those of buckthorn. This abuse may be discovered by opening the berries; those of buckthorn have almost always four seeds, the berries of the alder two, and those of the dogberry only one. Buckthorn berries, bruised on white paper, stain it of a green colour, which the others do not. Those who sell the juice to the apothecaries, are said to mix it with a large proportion of water.

Medical use.—Buckthorn berries have a faint disagreeable smell, and a nauseous bitter taste. They have long been in considerable

esteem as cathartics: and celebrated in dropsies, rheumatisms, and even in the gout: though in these cases they have no advantage above other purgatives, but are more offensive, and operate more severely, than many which the shops are furnished with. They generally occasion gripes, sickness, dry the mouth and throat, and leave a thirst of long duration. The dose is about twenty of the fresh berries in substance, and twice or thrice this number in decoction; an ounce of the expressed juice, or a drachm of the dried berries.

Off. prep.—Syr. rhamni cathart. *Ed. Lond.*

RHEUM PALMATUM. *Ed. Rhubarbarum. Lond. Dub. Willd. g. 808, sp. 5. Enneandria Monogynia.*—*Nat. ord. Oleraceæ.*

Palmated rhubarb.

Off.—Radix. The root.

THIS plant grows spontaneously in China, and endures the colds of our climate.

But it is not ascertained that the Chinese or Russian rhubarb is the dried root of this plant. Pallas thinks that it is obtained indiscriminately from the rheum undulatum, palmatum, and compactum, more especially from the first; while Mr. Sievers, an apothecary who was sent by Catharine II, on purpose to obtain the true rhubarb plant, and travelled for several years in the countries contiguous to that whence the rhubarb is brought, is of opinion, that the botanical characters of the plant which furnishes it are still unknown, excepting that it is said not to grow to a great size, and to have round leaves, which are toothed on the edges with almost spinous points.

All the rhubarb of commerce is brought from the Chinese town Sini, or Selim, by the Bucharrians. It grows on the neighbouring chain of lofty mountains which stretches to the lake Koko-Nor, between 35° and 40° north latitude. It is dug up by the poor peasants, cleaned from the earth, cut in pieces, strung with the bark on strings, and exposed to dry under cover in the shade for a whole year, before it is again cleaned and prepared for exportation.

There is a distinction made in commerce between the Russian and Chinese rhubarb, although they both come from the same country.

The Russian is dearer, and always good, as very great attention is paid both in purchasing and transporting it, by order of the government. In Kiachta, on the Russian frontier, it is received from the Bucharrians by a Russian apothecary, who examines it. The bad is immediately burnt, and the good is freed from its bark,

woody parts, and every impurity, in the most careful manner. It is then sent to Moscow and to Peterburgh, where it is again examined.

It is commonly in round pieces, of a reddish or whitish yellow colour, feels gritty between the teeth, and is often perforated with so large a hole, that many pieces have the appearance of a bark.

The Chinese or East-Indian rhubarb is brought by sea from Canton. It is heavier, harder, and more compact, than the other; seldom perforated with holes, and either in long pieces, or with two flat sides, as if they had been compressed. Dr. Lewis thinks that this is less aromatic, but stronger, than the Turkey; and that it has required less care in drying from having been lifted when the root was less watery.

The general characters of good rhubarb are, its having a whitish or clear yellow colour, being dry, solid, and compact, moderately heavy; brittle; when recently broken appearing marked with yellow or reddish veins, mixed with white; being easily pulverizable; forming a powder of a fine bright yellow, having the peculiar, nauseous, aromatic smell of rhubarb, and a sub-acrid, bitterish, somewhat astringent taste, and when chewed feeling gritty under the teeth, speedily colouring the saliva, and not appearing very mucilaginous. The size and form of the pieces are of little consequence; only we must break the large ones, to see that they are not decayed or rotten within; and we must also observe that they are not musty or worm-eaten. This is the more necessary, as damaged pieces are frequently so artfully dressed up, and coloured with powdered rhubarb, as to impose on the buyer.

The principal constituent of rhubarb is extractive matter, soluble both in alcohol and in water. By gentle decoction, it loses above one half its weight. Rhubarb also contains some volatile odorous matter, on which its peculiar nauseous smell, and its activity as a purge, depend; for when dissipated, either by age or any preparation to which the rhubarb has been subjected, the powers of the medicine are almost destroyed. It also contains some tannin, and about one sixth of its weight of oxalate of lime. Neumann got from 480 grains 180 of alcoholic, and afterwards 170 watery extract; and inversely, 350 watery and only 5 of alcoholic extract.

Medical use.—Rhubarb is a mild cathartic, which operates without violence or irritation, and may be given with safety even to pregnant women, and to children. In some people, however, it occasions severe griping. Besides its purgative quality, it is celebrated as an astringent, by which it strengthens the tone of the

stomach and intestines, and proves useful in diarrhoea and disorders proceeding from laxity.

Rhubarb is exhibited,

1. In substance, in the form of powder. It operates more powerfully as a purgative in this form than in any other. The dose for an adult is about a scruple or upwards. On account of its great bulk, it is sometimes unpleasant to take a sufficient dose; its laxative effects are therefore often increased by the addition of neutral salts or other more active purgatives. In smaller doses it often proves an excellent stomachic.

2. In infusion. Rhubarb yields more of its purgative property to water than to alcohol. The infusion is, however, considerably weaker than the powder, and requires double the dose to produce the same effect. It is well adapted for children, but must be always fresh prepared.

3. In tincture. On account of the stimulating nature of the menstruum, this preparation frequently cannot be exhibited in doses large enough to operate as a purgative. Its principal use is as a tonic and stomachic.

The virtues of rhubarb are destroyed by roasting, boiling, and in forming the extract.

Off. prep.—*Inf. Ed. Vin. Ed. Lond. Tinct. Ed. Lond. Tinct. comp. Lond. Tinct. cum aloe, Ed. Tinct. cum gentian, Ed. Pil. comp. Ed.*

RHODODENDRON CHRYSANTHUM. *Ed.*

Willd. g. 867, sp. 7. Decandria Monogynia.—*Nat. ord. Bicornes.*

Yellow-flowered rhododendron.

Off.—*Folia.* The leaves.

THIS small shrub grows in the coldest situations, and highest parts of the snow-covered mountains in East Siberia, and especially in Dauria. The leaves are oblong, rigid, reflected at the edges, rough on the upper surface, smooth, and paler on the lower. When dried, they have no smell, but a rough, astringent, and bitterish taste. They also contain a stimulant narcotic principle; for they increase the heat of the body, excite thirst, and produce diaphoresis, or an increased discharge of the other secretions or excretions; and in a larger dose, inebriation and delirium.

Medical use.—In decoction, it is used in Siberia in rheumatism and gout. About two drachms of the dried shrub are infused in an earthen pot, with about ten ounces of boiling water, keeping it near a boiling heat for a night, and the infusion taken in the morning. Besides its other effects, it is said to produce a sensation of prickling or creeping in the pained parts; but in a few

hours the pain and disagreeable symptoms are relieved, and two or three doses generally complete the cure. The use of liquids is not allowed during its operation, as vomiting is apt to be induced.

RHUS TOXICODENDRON. *Ed.*

Willd. g. 566, sp. 17. Pentandria Trigynia.—Nat. ord. *Dumosa.*

Poison oak.

Off.—Folia. The leaves.

THIS is a deciduous shrub of moderate growth, a native of North-America. The leaves are alternate, and stand upon very long leaf-stalks. Each leaf consists of three leaflets. It is said that its juice is so extremely acrid as to cause inflammation, and sometimes even sphacelation, in the parts touched with it.

Medical use.—It was first tried as a medicine by Dr. Alderson of Hull, in imitation of the experiments of M. Fresnoi with the *rhus radicans*. He gave it in four cases of paralysis, in doses of half a grain, or a grain, three times a-day, and all his patients recovered, to a certain degree, the use of their limbs. The first symptom of amendment was always an unpleasant feeling of prickling or twitching in the paralytic limbs. We have given it in larger doses, without experiencing the same success. It was not, however, inactive. In one case the patient discontinued its use on account of the disagreeable prickling it occasioned; and in general it operated as a gentle laxative, notwithstanding the torpid state of the bowels of such patients.

RIBES.

Willd. g. 445. Pentandria Monogynia.—Nat. ord. *Pomaceæ.*

Sp. 1. RIBES RUBRUM. Lond. Dub.

Red currant.

Off.—Fructus. The fruit.

THIS shrub grows wild in England, and is very generally cultivated for the sake of its pleasant sub-acid fruit. The juice of the fruit contains saccharine matter, malic and citric acids, and a substance scarcely soluble in cold water, very soluble in hot water, and coagulating into the form of a jelly as it cools. By boiling currant juice with a sufficient quantity of sugar to absorb the acid watery parts, the whole forms, on cooling, an uniform jelly, which is often used as an acid demulcent in sore throats; and, dissolved in water, forms a pleasant cooling drink in feverish complaints.

Sp. 8. RIBES NIGRUM. Lond. Dub.

Black currant.

Off.—Fructus. The fruit.

THIS is also a native shrub, which is likewise frequently cultivated for the same purposes with the former variety, and indeed is preferred to it for medical use.

Off. prep.—Syr. succi fructus rib. nig. Lond. Succus spissat. Lond.

RICINUS COMMUNIS. Ed. Lond. Dub.

Monoecia Monadelphica.—Nat. ord. Tricoccæ.

Palma Christi.

Off.—Semen, et ejus oleum fixum. The seeds, and the fixed oil obtained from them. Castor oil.

THIS plant grows in both Indies, Africa, and the south of Europe. It is of speedy growth, and in one year arrives at its full height, which seldom exceeds twenty feet. The capsules are prickly and triangular, and contain, under a thin, dry, grey, and black-marbled husk, a white oily kernel. The skin is extremely acrid; and one or two of the seeds swallowed entire operate as a drastic purgative or emetic.

The kernels yield almost a fourth part of their weight of a bland fixed oil, commonly called Castor oil. It is obtained from them either by expression or by decoction with water. The former method is practised in Europe, the latter in Jamaica. To increase the product, it is common to parch the seeds over the fire, before the oil is extracted from them; but the oil thus obtained is inferior to that prepared by cold expression or simple decoction, and is apt to become rancid.

Off. prep.—Oleum fixum, Lond.

Genuine castor oil is thick and viscid, of a whitish colour, insipid or sweetish to the taste, and without smell.

Medical use.—As a medicine, it is a gentle and useful purgative: it in general produces its effects without griping, and may be given with safety where acrid purgatives are improper, as in colic, calculus, gonorrhea, &c.: some likewise use it as a purgative in worm cases. Half an ounce or an ounce commonly answers with an adult, and a drachm or two with an infant.

The aversion to swallowing oil is generally so great, that different modes of taking it have been proposed. Some prefer taking it swimming on a glass of water, or peppermint water, or in the form of emulsion, with mucilage, or with the addition of a little rum.

ROSA.

Willd. g. 997. Icosandria Polygynia.—Nat. ord. *Senticosa*.

Sp. 16. ROSA GALLICA. Ed. Rosa rubra. Lond. Dub.

Red rose.

Off.—Petala. The petals.

THIS has not the fragrance of the succeeding species; but the beautiful colour of its petals, and their pleasant astringency have rendered them officinal. It must, however, be remarked that their odour is increased by drying, while that of the damask rose is almost destroyed.

Off. prep.—Syr. rosæ Gallicæ, *Ed. Mel. rosæ, Lond. Dub. Infus. Ed. Lond. Dub. Conserva, Ed. Lond. Dub.*

Sp. 17. ROSA DAMASCENA. Lond. Dub. Rosa centifolia. Ed.

Damask rose.

Off.—Petala. The petals.

THE native country of this shrub is unknown, but the delightful fragrance of its flowers has rendered it the favourite ornament of every garden. In the former editions of Linnæus, the damask rose was considered as a variety only of the rosa centifolia; but Aiton, Du Roy, and Willdenow have arranged it as distinct species. It is, however, highly probable, that the petals of all the varieties of the rosa centifolia, or Dutch hundred-leaved rose, Willdenow's 15th species, are employed indiscriminately with those of the real damask rose in the distillation of rose water.

Off. prep.—Syr. rosæ centifoliæ, *Ed. Lond. Aq. distil. Ed. Lond. Dub.*

Sp. 31. ROSA CANINA. Ed. Cynosbatus. Lond.

Dog rose.

Off.—Fructus recens. The fruit called Hips.

THIS shrub is found in hedges throughout Britain. The pulp of the fruit, besides saccharine matter, contains citric acid, which gives it an acid taste. The seeds, and stiff hair with which they are surrounded, must be carefully removed from the pulp before it can be used.

Off. prep.—Conserva, *Ed. Lond.*

ROSMARINUS OFFICINALIS. *Ed. Ros marinus. Lond. Rosmarinus. Dub.*

Willd. g. 62, sp. 1. Diandria Monogynia.—Nat. ord. *Verticillata*.

Rosemary.

Off.—*Summitas florens.* The herb and flowers.

ROSEMARY is a shrubby perennial, which grows wild in the south of Europe, and is cultivated in our gardens. It has a fragrant smell, and a warm pungent bitterish taste, approaching to those of lavender: the leaves and tender tops are strongest; next to these the cup of the flower; the flowers themselves are considerably the weakest, but most pleasant.

Medical use.—Its virtues depend entirely on its essential oil, which seems to be combined with camphor, not only from its peculiar taste, but from its possessing chemical properties, which depend on the presence of camphor; and from its depositing crystals of camphor when long kept.

Off. prep.—*Ol. vol. Ed. Lond. Dub. Spiritus, Ed. Lond.*

RUBIA TINCTORUM. *Ed. Rubia. Lond. Dub.*

Willd. g. 187, sp. 1. Tetrandria Monogynia.—*Nat. ord. Stel-latæ.*

Madder.

Off.—*Radix.* The root.

MADDER is perennial, and grows wild in some parts of Britain, but the dyers are principally supplied with it from Zealand, where it is cultivated in large quantities.

The roots consist of articulated fibres, about the thickness of a quill, which are red throughout, have a weak smell, and a bitterish astringent taste. For the use of the dyers, they are first peeled and dried, then bruised and packed in barrels. Madder possesses the remarkable property of tinging the urine, milk, and bones, of animals which are fed with it, of a red colour.

Med. use.—It is said to be useful in the atrophy of children, and some believe in its reputed powers as an emmenagogue.

It is given in substance in doses of half a drachm, several times a-day, or in decoction.

RUBUS IDÆUS. *Lond. Dub.*

Willd. g. 998, sp. 4. Icosandria Polygynia.—*Nat. ord. Senticosæ.*
Raspberry.

Off.—*Fructus.* The fruit.

THIS shrub is found wild in Britain, and is much cultivated for the sake of its pleasant sub-acid fruit, which contains both citric and malic acid.

Off. prep.—*Syr. succi fructus rub. idæi, Lond.*

RUMEX ACETOSA. *Ed. Acetosa pratensis. Lond. Acetosa. Dub.*

Willd. g. 699, sp. 31. Hexandria Trigynia.—*Nat. ord. Oleraceæ.*

Sorrel.

Off.—Folium. The leaves.

SORREL is a perennial plant, which grows wild in fields and meadows throughout Britain. The leaves have an astringent acid taste, without any smell or particular flavour: their medical effects are, to cool, quench thirst, and promote the urinary discharge: a decoction of them in whey affords an useful and agreeable drink in febrile or inflammatory disorders.

All these effects are to be ascribed entirely to the super-oxalate of potass which they contain.

RUTA GRAVEOLENS. *Ed. Ruta. Lond. Dub.*

Willd. g. 927, sp. 1. Decandria Monogynia.—Nat. ord. *Multifilique.*

Rue.

Off.—Herba. The herb.

THIS is a small shrubby plant, a native of the south of Europe, and cultivated in our gardens.

Rue has a strong ungrateful smell, and a bitterish penetrating taste: the leaves, when in full vigour, are extremely acrid, inso-much as to inflame and blister the skin, if much handled. Neumann got from 960 grains of the dried leaves 330 alcoholic extract, and afterwards 290 watery; and inversely, 540 watery and 40 alcoholic. Both primary extracts are bitter and acrid. Rue also contains a volatile oil, which congeals readily, and is obtained in greatest quantity by distilling the plant with the seeds half ripe.

Medical use.—With regard to its medical virtues, like other remedies, of which the active constituent is an essential oil, it is heating and stimulating, and hence it is sometimes serviceable in spasmodic affections, and cases of obstructed secretions.

Off. prep.—Ol. volat. *Dub.* Extract, *Ed. Lond. Dub.* Pulv. myrrh. comp. *Lond.*

SACCHARUM OFFICINARUM.

Willd. g. 122, sp. 4. Triandria Digynia.—Nat. ord. *Gramina.*

a. *Saccharum non purificatum.* *Lond. Ed. Saccharum rubrum. Dub.*

b. *Saccharum purificatum.* *Lond. Dub. Saccharum purissimum. Ed.*

c. *Sacchari rubri syrupus.* *Dub.*

Sugar-cane. Raw or brown sugar. Double refined sugar. Molasses.

THE sugar-cane grows wild in both Indies, and forms the chief object of cultivation in the West Indies.

Sugar, of which we have already noticed the general properties, is principally obtained from this plant, by boiling down its expressed juice, with the addition of a certain proportion of lime or potash, until the greater part is disposed to concrete into brownish or yellowish crystalline grains. The lime or potash is added to saturate some malic acid, whose presence impedes the crystallization. The *molasses*, or that portion of the inspissated juice which does not crystallize, is separated from the *raw sugar*, which is sent to Europe to be refined. This is performed by dissolving it in water, boiling the solution with lime-water, clarifying it with blood or white of eggs, and straining it through woollen bags. The solution, after due evaporation, is permitted to cool to a certain degree, and then poured into conical forms of unglazed earthen ware, where it concretes into a mass of irregular crystals. The syrup which has not crystallized is then permitted to run off through a hole in the apex of the cone. The upper or broad end of the cone is then covered with moist clay, the water of which gradually penetrates into the sugar, and displaces a quantity of syrup, which would otherwise be retained in it, and discolour it. It is then carefully dried, and gets the name of *loaf* or *lump sugar*. When the solution and other steps of the process are repeated, the sugar is said to be *double refined*. Sugar is sometimes made to assume a more regular form of crystallization, by carrying the evaporation only a certain length, and then permitting the syrup to cool slowly. In this form it is called *Brown* or *White sugar candy*, according to the degree of its purity.

Raw sugar varies very much in quality. It should be dry, crystallized in large sparkling grains, of a whitish or clear yellow colour, without smell, and of a sweet taste, without any peculiar flavour.

Refined sugar should have a brilliant white colour, and a close compact texture. It should be very hard, but brittle, and break with sharp, semi-transparent, splintery fragments.

Medical use.—Sugar, from being a luxury, has now become one of the necessaries of life. In Europe sugar is almost solely used as a condiment. But it is also a very wholesome and powerful article of nourishment; for during crop time, the negroes in the West Indies, notwithstanding their increased labours, always grow fat. It is in this way also that its internal employment is useful in some diseases, as in sea scurvy; for sugar produces no particular effect as a medicine, except that the coarser and impure kinds are slightly purgative. Applied externally it acts as an escharotic in spongy and unhealthy granulations; and to abraded

or inflamed surfaces it proves gently stimulant. In pharmacy it is principally employed to cover bad tastes, to give form to, and to preserve more active substances. In using it for the last purpose, we must always remember, that if the proportion of sugar employed be too small, it will promote instead of retarding the fermentation of the articles it is intended to preserve.

Off. prep.—Syrupi omnes, *Ed. Lond. Dub.* Succus spissat. samb. nigri, *Ed.* Mistura moschata, *Lond.* Potio carbonat. calcis, *Ed. Lond. Dub.* Pulv. scam. cum calomel, *Lond.* Pulv. trag. comp. *Lond.* Elect. Cassiæ sennæ, *Ed. Lond.* Elect. aromat. *Dub.* Confect. aromat. *Lond.* Trochisci carb. calcis, *Ed. Lond.* Troch. glycyrr. *Lond. Dub. Ed.* Troch. gummosi, *Ed. Lond.* Troch. magn. *Lond.* Troch. nitrat. pot. *Ed. Lond.* Troch. sulph. *Lond.*

Molasses or treacle is a very impure syrup. It is thick, viscid, of a dark brown, almost black colour, and has a peculiar smell, and a sweet, somewhat empyreumatic taste. Treacle is applied to many domestic and economical purposes; and in hospital practice may supersede the use of sugar in many instances.

Off. prep.—Elect. sennæ, *Dub.*

SAGAPENUM. *Gummi-resina. Lond. Dub. Ed.*

Sagapenum. A gum-resin.

The plant which furnishes this substance is not ascertained, but is conjectured by Willdenow to be the *Ferula Persica*.

Sagapenum is a concrete juice brought from Alexandria, either in distinct tears, or agglutinated in large masses. It is outwardly of a yellowish colour; internally, somewhat paler, and clear like horn; it grows soft upon being handled, and sticks to the fingers; its taste is hot, nauseous, and bitterish, and its smell disagreeable and alliaceous.

Neumann got from 480 grains, 306 alcoholic, and 108 watery, extract, and inversely 170 watery, and 241 alcoholic, extract. The alcohol distilled from it was sensibly impregnated with its flavour, and along with the water a considerable portion of volatile oil arose. It is not fusible.

Medical use.—In medical virtues it holds a kind of middle place between *assa foetida* and *galbanum*, and may be employed in the same manner, and under similar circumstances.

Off. prep.—Pil. galb. comp. *Lond.*

SALIX FRAGILIS. *Salix. Dub.*

Dioecia Diandria.—Nat. ord. *Amentaceæ*.

Crack-willow.

Off.—Cortex. The bark.

THIS willow grows wild in England. The bark possesses a considerable degree of bitterness and astringency. Different species of willow have at different times been recommended as substitutes for the Peruvian bark: they are certainly powerful astringents, but in point of efficacy in the cure of disease, they are in no degree to be compared with the Peruvian bark, from which they differ in containing no cinchonin.

SALVIA OFFICINALIS. *Ed. Salvia. Lond. Dub.*

Willd. g. 63, sp. 7. Diandria Monogynia.—*Nat. ord. Verticillatae.*

Sage.

Off.—*Folium.* The leaves.

SAGE is a perennial plant, a native of the south of Europe, and cultivated in our gardens. There are several varieties of it, differing in size, or in the colour of its flower, but their properties are the same. They have a peculiar aromatic smell, and a warm aromatic taste, with some degree of bitterness and astringency.

Medical use.—In its effects sage agrees with other aromatics. It is stimulant, carminative, and tonic. In cold phlegmatic habits, it excites appetite, and proves serviceable in debilities of the nervous system. The best preparation for these purposes is an infusion of the dried leaves, drunk as tea; or a tincture, or extract, made with rectified spirit, taken in proper doses; these contain the whole virtues of the sage; the distilled water and essential oil only its warmth and aromatic quality, without any of its roughness or bitterness. Aqueous infusions of the leaves, with the addition of a little lemon-juice, prove an useful diluting drink in febrile disorders, being sufficiently agreeable to the palate.

SAMBUCUS NIGRA. *Ed. Sambucus. Lond. Dub.*

Willd. g. 569, sp. 3. Pentandria Trigynia.—*Nat. ord. Diumosa.*

Common elder.

Off.—*Flos, Bacca, Cortex.* The inner bark, flowers, and berries.

THIS tree is frequent in hedges; it flowers in May, and ripens its fruit in September. The berries contain malic acid, and have a sweetish, not unpleasant, taste; nevertheless, eaten in substance, they offend the stomach. For the market they are gathered indiscriminately from the *Sambucus nigra* and *ebulus*, a very venial fraud, as their effects are exactly the same. They are, however, easily distinguished, by the latter, when bruised, staining the fingers of a red colour, and the former of the colour of a withered leaf.

Med. use.—The expressed juice, inspissated to the consistence of a rob, proves an useful aperient medicine; it opens obstructions of the viscera, promotes the natural evacuations, and, if continued for a length of time, does considerable service in various chronical disorders. The inner green bark of its trunk is gently cathartic. An infusion of it in wine, or the expressed juice, in the dose of half an ounce or an ounce, is said to purge moderately, and in small doses to prove an efficacious deobstruent, capable of promoting all the fluid secretions. The young leaf buds are strongly purgative, and act with so much violence as to be deservedly accounted unsafe. The flowers are very different in quality: these have an agreeable aromatic flavour, which they yield in distillation to water, and impart by infusion to vinous and spiritous liquors.

Off. prep.—Succus spissat. *Lond. Ed. Ungt. sambuci, Lond. Dub.*

SAPO.

Sapo ex oleo olivarum et soda confectus. Ed. Sapo ex oleo olivæ et natro confectus. Lond. Sapo durus Hispanicus. Dub.

Soap. Spanish hard soap.

THE general chemical properties of soap have been already noticed. The only species which is officinal in our pharmacopœias, is that composed of olive oil and soda. It is only prepared in the countries which produce the oil. For medicinal use we prefer the Spanish.

It should be white and hard, dissolve entirely in water and in alcohol, forming with the former a milky, and with the latter a transparent solution; and the solutions should froth freely on agitation. It should not be variegated in its colour, feel greasy or moist, or be covered with a saline efflorescence; and the solutions should not have a rancid smell or taste. Some of the foreign Dispensatories are so very particular about the nature of the soap used in medicine, as to direct it to be prepared by the apothecary, by simply triturating, without the assistance of heat, Provence oil, with half its weight of a solution of soda, of the specific gravity of 1.375, until they unite.

Soap is decomposed by all the acids, earths, and earthy and metalline salts. The acids combine with the alkali, and separate the oil. The earths form an insoluble earthy soap with the oil, and separate the alkali; while with the salts there is a mutual decomposition, their acid combines with the alkali, and earthy or metalline soaps are formed.

Med. use.—The detergent property of soap, or the power it possesses of rendering oily and resinous substances miscible with water, has given rise to very erroneous notions of its medical

virtues. It was supposed to render such substances more readily soluble in the juices of the stomach, and in the fluids of the body, and to be well fitted for dissolving such oily or unctuous matters as it may meet with in the body, attenuating viscid juices, opening obstructions of the viscera, and deterring all the vessels it passes through. It has likewise been supposed a powerful menstruum for the urinary calculus; and a solution of soap in lime-water, has been considered as one of the strongest dissolvents that can be taken with safety into the stomach; for the virtue of this composition has been thought considerably greater than the aggregate of the dissolving powers of the soap and lime-water when unmixed.

How erroneous these ideas are, appears evidently, when we recollect the very easy decomposition of soap, which renders it perfectly impossible that it should enter the circulating system, or indeed come into contact with the fluids even of the mouth, without being decomposed. As to the solution of soap in lime-water, we may observe, that it is only a clumsy way of exhibiting a solution of soda; for the soap is decomposed, an insoluble soap of lime is formed, and the soda remains in solution. The internal use of soap should therefore be confined, in our opinion, to the giving form to other substances which are not decomposed by it, and to decompose metallic poisons when they have been taken into the stomach. For this last purpose, a tea cupful of a solution of soap, in four times its weight of water, may be drunk every three or four minutes, until a sufficient quantity be taken.

Applied externally, it is a very powerful detergent, and combines the stimulating properties of the alkali with the lubricating nature of the oil. In this way it often proves a powerful discutient, and a useful application to sprains and bruises.

Off. prep.—*Tinct. Ed.* *Tinct. cum opio, Ed.* *Linim sap. Lond.* *Dub.* *Sp. am. succin. Lond.* *Pil aloet, Ed.* *Pil aloes cum assa foetid. Ed.* *Pil scill. Lond. Dub.* *Pil stib. comp. Dub.* *Cerat saponis, Lond. Dub.* *Emp. sap. Lond. Dub. Ed.*

SCILLA MARITIMA. *Ed.* *Scilla. Lond. Dub.*

Willd. g. 640, sp. 1. Hexandria Monogynia.—*Nat. ord. Liliaceæ.*

Squill.

Off.—*Radix.* The root.

THE squill is a perennial bulbous-rooted plant, which grows wild on the sandy shores of Spain, Portugal, north of Africa, and the Levant.

The root is about the size of the fist, pear-shaped, with the apex upwards, and consists of fleshy scales, attenuated at both edges, surrounded by other scales, which are arid, thinning, and

so thin that the root at first sight seems to be tunicated. The recent roots are full of a white viscid juice, have scarcely any smell, but a very bitter, nauseous, and extremely acrid, taste. Rubbed on the skin, it inflames and blisters.

It is more commonly met with in the shops, in the form of the dried scales, which should be brittle, semipellucid, smooth, but marked with lines, and when chewed, should feel tenacious, and taste very bitter, without manifest acrimony.

The active constituent of the squill is the acrid principle; and, therefore, it becomes almost inert by too much drying, or by being kept too long in the form of powder. It also contains bitter extractive, much mucilage, albumen, and starch.

Medical use.—Given internally in large doses, it produces purging and vomiting, sometimes even stranguary, bloody urine, inflammation and erosion of the stomach. In smaller doses it proves a useful expectorant and diuretic, and it is said to lessen the frequency of the pulse.

Squill is sometimes given as a general stimulant in typhus, especially to cattle. But it is much more frequently exhibited as an expectorant where the lungs are loaded with viscid matter, and as a diuretic in dropical cases, for which purpose it is commonly conjoined with calomel.

The dose of squill is one or two grains three or four times a day; and the most commodious form for the taking of squills, unless when designed as an emetic, is that of a bolus, or pill: liquid forms are to most people too offensive, though these may be rendered less disagreeable both to the palate and stomach by the addition of aromatic distilled waters.

Off. prep.—Syrupus scillæ maritimæ, *Ed.* Mel. scillæ, *Lond. Dub.* Oxymel scillæ, *Lond.* Scill. mar. exsiccat, *Ed. Lond. Dub.* Acet. scillæ, *Lond. Dub.* Conserva, *Lond.* Tinctura, *Lond. Dub.* Pil, *Ed. Lond. Dub.*

SINAPIS.

Willd. g. 1246. *Tetradynamia Siliquosa.*—*Nat. ord. Siliquosa.*

Sp. 4. SINAPIS ALBA. *Ed.* Sinapis, *Dub.*

White mustard.

Off.—Semen. The seeds.

Sp. 5. SINAPIS NIGRA. *Sinapis. Lond.*

Common mustard.

Off.—Semen. The seeds.

THESE plants are both annual, both grow wild in England, and possess similar virtues.

They produce small round compressed seeds, which have an

acid bitterish taste, and a pungent smell when reduced to powder. The common mustard has blackish seeds, and is more pungent than the white.

They impart their taste and smell in perfection to aqueous liquors, whilst rectified spirit extracts extremely little of either: the whole of the pungency arises with water in distillation. Committed to the press, they yield a considerable quantity of a soft insipid oil, perfectly void of acrimony: the cake left after the expression, is more pungent than the mustard itself.

Medical use.—Mustard-seed is swallowed entire, to the quantity of a table spoonful or more, to stimulate the stomach in some cases of dyspepsia, and to excite the peristaltic motion of the intestines, especially when they are torpid, as in paralysis. The powder made into a paste with water, is commonly used as a condiment with animal food; infused in water, it proves emetic when taken in considerable doses, and in smaller ones, acts as a diuretic and aperient; but it is more frequently applied externally as a topical stimulus, made into a paste or sinapism with vinegar and bread-crumbs.

Off. prep.—Oleum fixum, *Lond. Dub.* Cataplasma, *Lond. Dub.* Emp. mel. vesic. comp. *Ed.*

SISYMBRIUM NASTURTIUM. *Ed. Nasturtium aquaticum. Lond. Dub.*

Willd. g. 1238, sp. 1. Tetradymania Siliquosa.—Nat. ord. *Siliquosæ.*

Common water-creffes.

Off.—Herba. The recent herb.

THIS plant is perennial, and grows wild in clear springs and rivulets throughout Britain. Its leaves remain green all the year, but are in greatest perfection in the spring. They have a quick pungent smell (when rubbed betwixt the fingers), and an acid taste, similar to that of scurvy-grass, but weaker. By drying or boiling, it loses its sensible qualities entirely.

Medical use.—It acts as a gentle stimulant and diuretic: for these purposes, the expressed juice, which contains the peculiar taste and pungency of the herb, may be taken in doses of an ounce or two, and continued for a considerable time.

SIUM NODIFLORUM *Sium. Lond.*

Willd. g. 544, sp. 4. Pentandria Digynia.—Nat. ord. *Umbellatæ.*

Creeping skerrit.

Off.—Herba. The herb.

THIS plant is perennial, and grows wild in rivers and ditches

in England. It was formerly alleged to be not only diuretic, but also emmenagogue and lithontriptic. With these intentions, however it is not now employed.

SMILAX SARSAPARILLA. *Ed. Sarsaparilla. Lond. Dub. Diætia Hexandria.*—Nat. ord. *Sarmentacea.*

Sarsaparilla.

Off.—Radix. The root.

THIS root is brought from the Spanish West Indies. It consists of a great number of long strings hanging from one head: the long roots, the only part made use of, are of a blackish colour on the outside, and white within, about the thickness of a goose-quill, or thicker, flexible, composed of a very small woody heart, surrounded with fibres running their whole length, which renders them extremely apt to split. They have a glutinous, bitterish, not ungrateful taste, and no smell. Inferior kinds of this root are also sold. They are in general thicker, of a paler colour on the outside, and less white within, with a much thicker woody heart. Neumann got from 960 grains, 360 watery, and 10 alcoholic, extract, and inversely 240 alcoholic, and 120 watery.

Medical use—It was first brought into Europe by the Spaniards, about the year 1563, with the character of being a specific for the cure of the lues venerea, a disease which made its appearance a little before that time, and likewise of several obstinate chronic disorders. It is, however, a very inert mucilaginous substance; and the diaphoresis, which it is sometimes supposed to produce, is entirely owing to the warm and diluent regimen employed at the same time.

Off. prep.—Decoct. *Ed. Lond. Dub.*

SOLANUM DULCAMARA. *Dulcamara. Dub.*

Willd. g. 383, sp. 15. Pentandria Monadelphia.—Nat. ord. *Solanaceæ.*

Bitter-sweet.

Off.—Stipites. The twigs.

THIS plant grows wild in moist hedges, has woody brittle stalks, and climbs on the bushes. The twigs should be gathered early in spring. The taste, as the name of the plant expresses, is both bitter and sweet; the bitterness being first perceived, and the sweetness afterwards; and when fresh they have a nauseous smell.

Med. use.—The dulcamara was formerly much esteemed as a powerful medicine. It is in general said to increase all the evacuations; and in large doses, to produce nausea, vomiting, and convulsions; but its effects seem to differ according to the nature of

the soil on which it grows. It has been recommended in cutaneous and venereal affections, in rheumatic and cathartic swellings, in ill-conditioned ulcers, scrophula, indurations from milk, leucorrhœa, jaundice, and obstructed menstruation. It has principally been employed under the form of the watery infusion, of a scruple taken daily, and gradually increased to two ounces. In the form of extract from 5 to 10 grains may be given for a dose.

SOLIDAGO VIRGA AUREA. *Virga aurea.* Dub.

Willd. g. 1483, sp. 35. Syngenesia Superflua.—Nat. ord. *Composita radiata.*

Golden-rod.

Flos, folium. The flowers and leaves.

This plant is perennial, and is found wild on heaths and in woods, producing spikes of yellow flowers in August. The leaves have a moderately astringent bitter taste; and thence prove serviceable in debility and laxity of the viscera, and disorders proceeding from that cause.

SPARTIUM SCOPARIUM. *Ed. Genista.* Lond. Dub.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*

Common broom.

Off.—Summitas, semen. The tops and seeds.

THIS is a very common shrub on dry pastures.

The leaves have a very bitter taste, and when given in decoctions prove considerably diuretic. The seeds have similar properties.

Off. prep.—Extract, Lond.

SPIGELIA MARILANDICA. *Ed. Spigelia.* Lond. Dub.

Wild. g. 308, sp. 2. Pentandria Monogynia.—Nat. ord. *Stelata.*

Carolina pink.

Off.—Radix. The root.

THIS plant is perennial, and grows wild in the southern parts of North America. The roots are celebrated as anthelmintic, particularly for the expulsion of lumbrici from the alimentary canal. Some order it in doses of ten or fifteen grains; and allege it is apt to occasion nervous affections if given in large doses; while others order it in drachm doses, alleging that the bad effects mentioned more readily happen from small doses, as the large ones often purge or puke; some prefer the form of infusion. An emetic is generally premised; and its purgative effect is assisted by some suitable additions.

SPONGIA OFFICINALIS. Ed. *Spongia. Lond. Dub.*

Cl. *Zoophyta. Ord. Spongia.*

Sponge.

SPONGE is principally found in the Mediterranean and Red seas. It was long supposed to be a vegetable production, but it is now universally allowed to belong to that remarkable class of animals called Zoophytes, which are negatively characterized by Cuvier, as having no vertebræ, no sanguiferous vessels, no spinal marrow, and no articulated limbs. The sponges belong to that division of the zoophytes, which are attached to a solid trunk, and are particularized by their base being spongy, friable, or fibrous.

Sponge is a soft, light, very porous and compressible substance, absorbing by capillary attraction a large proportion of any fluid in which it is immersed.

Med. use.—From these properties it is an useful substance in the practice of surgery. When applied to ulcers which are accompanied with a copious discharge, it absorbs the thinner and more acrid fluid, and leaves the ulcers covered with the thicker and blander matter. It is also useful in suppressing hæmorrhagies, when properly applied by compression, by favouring the coagulation of the blood at the mouths of the vessels. It also forms a convenient tent for dilating wounds and fistulous ulcers, especially when prepared by immersing it in melted wax, and keeping it compressed until it cools. On the melting of the wax by the heat of the part to which it is applied, it gradually expands, and affords an uniform and gently dilating pressure.

Burnt sponge is nothing else than charcoal mixed with a little muriate of soda and phosphate of lime.

Off. prep.—*Spongia usta, Lond. Dub.*

STALAGMITIS CAMBOGIoidES. Murray. *Gambogia. Ed. Lond. Dub.*

Polygamia Monœcia.—Nat. ord. *Tricocca.*

Gamboge.

Off.—Gummi-resina. The gum-resin, called Gamboge.

THE tree which furnishes the gamboge is of middling size, and grows wild in the kingdom of Siam and in Ceylon. In Siam the gum-resin is obtained in drops by breaking the leaves and young shoots; hence probably its name Gummi-guttæ; but in Ceylon it is extracted from the wood of the tree in the form of a juice, which soon becomes solid. Gamboge, or at least a very similar substance, is also got in the same way from different species of *Garcinia*, especially the *Gambogia*; (the *Gambogia Gutta* of Lin.) Willd. g. 938, sp. 3. *Dodecandria Monogynia*, and from different

species of hypericum, especially the bacciferum. It is brought from the East Indies in large cakes or rolls. The best sort has a deep yellow or orange colour, shining fracture, and is free from impurities. It has no smell, and very little taste, unless kept in the mouth for some time, when it impresses a slight sense of acrimony. Neumann got from 16 ounces, 14 of alcoholic extract, and one of watery, and inversely 13 of watery, and two of alcoholic. He also found it almost entirely soluble in water, impregnated with a moderate proportion of fixed alkaline salt. According to my experiments, which confirm these observations, the watery solution is opaque and yellow. With alcohol it forms a transparent solution of a bright golden colour; and the residuum is totally soluble in water. The alcoholic solution is decomposed by water, becoming yellow and opaque; but the precipitate remains long suspended, and cannot be separated by common filtering paper. Gamboge is readily soluble in solution of potash, acquiring a bright red colour the moment it is thrown into it, and forming a dark-coloured solution, which is not decomposed by water, but by the addition of any acid immediately produces a copious yellow precipitate, very soluble in excess of acid. The residuum is soluble in water. Ammoniated alcohol dissolves gamboge with similar phenomena. It is also very soluble, but with decomposition in acids. The acid solution is decomposed by water.

Med. use.—Gamboge evacuates powerfully both upwards and downwards; some condemn it as acting with too great violence, and occasioning dangerous hypercatharsis; while others are of a contrary opinion. Geoffroy seems particularly fond of this medicine, and informs us, that he has frequently given from two to four grains, without its proving at all emetic; that from four to eight grains both vomit and purge without violence; that its operation is soon over; and that if given in a liquid form, and sufficiently diluted, it does not need any corrector; that in the form of a bolus or pill, it is most apt to prove emetic, but very rarely has this effect if joined along with *Calomel*. He nevertheless cautions against its use where the patients cannot easily bear vomiting.

It has been used in dropsy with cream of tartar or jalap, or both, to quicken their operation. It is also recommended by some to the extent of fifteen grains, with an equal quantity of vegetable alkali, in cases of the tape-worm. This dose is ordered in the morning; and if the worm is not expelled in two or three hours, it is repeated even to the third time with safety and efficacy. It is asserted, that it has been given to this extent even in delicate habits.

It is an ingredient, and probably the active one, in most of the nostrums for expelling tæniæ.

STANNUM. *Lond. Limatura et pulvis. Dub. Ed.*

THE general properties of tin have been already mentioned. It is found,

1. Sulphuretted, and combined with copper. Tin-pyrites.
2. Oxidized.
 - a. Combined with oxide of iron and silica. Common tin stone.
 - b. Combined with oxide of iron and a little arsenic. Fibrous tin stone.

The best tin is found in Cornwall, or is brought from the East Indies. Its purity is estimated by its small specific gravity, and by the crackling noise it makes when bent.

It is now only used as an anthelmintic, especially in cases of tænia, and probably acts mechanically.

Off. prep.—Pulvis stanni, *Lond. Dub.*

STYRAX.

Willd. g. 874. Decandria Monogynia.—*Nat. ord. Bicornes.*

Sp. 1. STYRAX OFFICINALE. Ed. Styra. Lond. Styra calamita. Dub.

Storax.

Off.—Balsamum. A Balsam.

THIS tree grows in the Levant, Italy, and France. The storax flows from wounds made in the bark, in countries where the heat is sufficient, for neither in France nor in Italy does it furnish any.

It is either in small distinct tears, of a whitish or reddish colour or in large masses composed of such, or in masses of an uniform texture and yellowish red or brownish colour; though sometimes likewise interspersed with a few whitish grains.

The common storax of the shops is in large masses, considerably lighter and less compact than the foregoing; it appears on examination to be composed of a fine resinous juice, mixed with quantity of saw-dust.

Storax has an agreeable smell, and an aromatic taste. Neumann got from 480 grains, 360 alcoholic, and 30 of watery, extract, and inversely 120 watery, and 240 alcoholic. In distillation it yields benzoic acid. It is, therefore, a balsam, or natural combination of resin with benzoic acid.

Off. prep.—Styrax purif. *Lond. Dub. Tinct. benz. comp. Lond. Ed.*

Sp. 3. STYRAX BENZOIN. Ed. Benzoë. Lond. Benzoinum. Dub.

Benzoin.

Off.—Balsamum. A balsam.

THIS species grows in Sumatra, and, like the former, also furnishes a balsam on being wounded.

It is brought from the East-Indies only, in large masses composed of white and light brown pieces, with yellowish specks, breaking very easily betwixt the hands: that which is whitest, and freest from impurities, is most esteemed.

In its properties it differs from storax, only in containing a larger proportion of benzoic acid. Neumann found that it was totally soluble in alcohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. By sublimation he got two ounces of impure acid from sixteen of benzoin. Lime and the alkaline carbonates dissolve the acid without attacking the resin, and are accordingly employed in the processes of Scheele, Götting, and Gren, for obtaining the benzoic acid. I find that the solution of potash dissolves benzoin very rapidly, forming a dark coloured solution, mixed with fine crystals of benzoate of potash. This alkaline solution is not decomposed by water, but forms with acids a rose-coloured coagulum, easily soluble in excess of acid. Boiling nitrous acid also attacks benzoin with great violence, and dissolves it entirely; the solution becomes turbid, and lets fall a copious precipitate on cooling, which, according to Mr. Brande, is benzoic acid. It is decomposed by water, and by alkaline solutions.

Off. prep.—Acid benzoic, *Ed. Lond. Dub.* Tinct. benz. comp. *Ed. Lond.*

SUB-BORAS SODÆ. Boras Soda. Ed. Borax. Lond. Dub.
Sub-borate of soda. Borax.

BORAX is found only in Thibet and Persia. It exists in the water of some wells and lakes, and is extracted from them by evaporation. In its impure state it is called tincal, and is brought from the East Indies in great masses, composed of a few large crystals, but chiefly of smaller ones, partly white and partly green, joined together as it were by a greasy yellow substance, intermixed with sand, small stones, and other impurities. By repeated solutions, filtrations, and crystallizations, it shoots into hexangular prisms, of which two sides are broader than the others, terminated by triangular pyramids, of a white colour, a styptic and alkaline taste, colouring vegetable blues green, soluble in eighteen parts of water at 60°, and in six at 212°, slightly efflorescing in the air, and, when heated, swelling, and, with the loss

of nearly half its weight, forming a porous friable mass, which, in a greater heat, melts into a transparent glass soluble in water. Besides the acids and alkalies which have a greater affinity for its acid or base than these have for each other, it is decomposed by sulphates, muriates, nitrates, phosphates, and fluates, of all the earths and of ammonia. It consists of 39 boracic acid, 17 soda, and 44 water.

Medical use.—The medical virtues of borax have not been sufficiently ascertained by experience : it is supposed to be, in doses of half a drachm or two scruples, diuretic, emmenagogue, and a promoter of delivery. Mr. Bisset, in an essay on the medical constitution of Great Britain, recommends a solution of this salt in water, as the most powerful dissolvent yet known, of aphthous crusts in the mouth and fauces of children. And for the same purpose also, a small quantity of it is often applied in the form of powder mixed up with sugar. There are strong reasons to believe, that the virtues of borax are much greater than they are in general supposed to be; and that it may be more extensively used with advantage.

SUCCINUM. *Ed. Lond. Dub.*

Amber.

THIS is a solid, brittle, bituminous, substance, dug out of the earth, or found upon the sea-shores: the largest quantities are met with along the coasts of Polish Prussia and Pomerania. It is of a white, yellow, or brown colour, sometimes opaque, and sometimes very clear and transparent.

It emits an agreeable smell when heated or rubbed. By friction it becomes electric; and when heated it softens, swells, and then melts and burns with a greenish or bluish flame, leaving a coaly residuum. By distillation it affords a little acetous acid, an essential oil, and a peculiar acid, named from it the Succinic. It is not acted upon by water, or diluted acids. It is imperfectly dissolved in alcohol and ether. Hoffmann dissolved it in oil of almonds in Papin's digester, and in a boiling solution of potash. Dr. Thomson lately discovered that it was soluble in the cold, even in a very weak solution of the sub-carbonate of potash. Heyer ascertained that it was soluble with decomposition in nitrous acid. In attempting to form succinic acid by the action of nitrous acid on amber, I made the same observation. The acid when heated to ebullition acts violently, copious red fumes are emitted, and the amber is first as if melted, and then dissolved. On cooling, part of the amber separates. The acid solution is decomposed by water, and by alkaline solutions. Amber is rendered soluble in the fixed and volatile oils, by melting or roasting it, or by the addition of a little camphor.

It is only used in pharmacy for the empyreumatic oil and acid obtained from it.

Off. prep.—Acid. et ol. succini, *Lond. Ed. Dub.* Succin. ppt. *Lond.*

SULPHAS.

SULPHATE is a generic term for the combination of sulphuric acid with the alkalies, earths, and metallic oxides. Their generic characters have been already noticed. Like the other genera, they may be divided into three families.

Family 1. Alkaline sulphates.—These form no precipitate with alkaline carbonates.

Family 2. Earthy sulphates.—These are either insoluble in water, or, if soluble, form a white precipitate with alkaline carbonates.

Family 3. Metalline sulphates.—These form precipitates, which are often coloured, with alkaline carbonates in general, with prussiate of potash and iron, and with gallic acid.

SUPER-SULPHAS ALUMINÆ ET POTASSÆ. *Sulphas Aluminae. Ed. Alumen. Lond. Dub.*

Super-sulphate of alumina and potash. Alum.

ALUM is obtained principally from schistose clays, which contain iron pyrites, by roasting, exposure, lixiviation, the addition of a proportion of potash ley, evaporation, and crystallization.

The roasting destroys the bituminous matters these clays commonly contain, the exposure to the air acidifies the sulphur of the pyrites, and the addition of alkali is absolutely necessary for the constitution of alum, which is a triple salt, with excess of acid, consisting of sulphuric acid, alumina, and potash, or ammonia, or a mixture of both. The properties of alum do not seem to be affected by the nature of the alkali. To save the trouble of evaporation, M. Curadon has given another method of manufacturing this substance. He takes 100 parts of clay, and 5 parts of muriate of soda, dissolved in as much water as is necessary to form the whole into a paste, which is made into cakes, and baked for two hours in a reverberatory furnace: The mass is then reduced to powder, and put into a good cask; a quarter of its weight of sulphuric acid is then added to it at several times, stirring it well each time. After the vapours of the muriatic acid are disengaged, an equal quantity of water with the acid is added. The mixture then becomes hot, swells, and emits very abundant vapours. When the heat is somewhat moderated, more water must be added, until there is about eight or ten times as much as of the acid. The liquor is then drawn off into leaden vessels,

and an equal quantity of water poured upon the residuum, which is also drawn off and added to the former. To these is lastly added a solution containing as much potash as is equal to a fourth part, or sulphate of potash equal to one half, the weight of the acid. As the liquor cools, it affords crystallized alum, equal in weight to three times the acid, and which may be farther purified by re-dissolving it in the smallest possible quantity of boiling water, and allowing it to crystallize.

Alum crystallizes in regular octohedrons, whose sides are equilateral triangles. It has a sweetish but very astringent taste. It is soluble in 15 times its weight of water at 60° , and in three fourths of its weight at 212° . It reddens vegetable blues. It effloresces slightly in the air. By the action of heat it first undergoes the watery fusion, then loses its water of crystallization, and lastly great part of its acid. It is decomposed by baryta, potash, soda, strontia, and all salts of which these are the bases; by the nitrate, muriate, phosphate, carbonate, borate, and fluuate, of ammonia; by the nitrate, muriate, phosphate, and carbonate, of magnesia; and by the nitrate, muriate, and carbonate, of lime. It is also decomposed by the gallic acid, by colouring matters, and by many animal and vegetable substances, in a manner not yet sufficiently understood.

It commonly consists, according to Vauquelin, of 49 sulphate of alumina, 7 sulphate of potash, and 44 of water.

Medical use.—Alum is a powerful astringent: it is reckoned particularly serviceable for restraining hæmorrhagies, and immoderate secretions from the blood; but less proper in intestinal fluxes. In violent hæmorrhagies, it may be given in doses of fifteen or twenty grains, and repeated every hour or half hour till the bleeding abates: in other cases, smaller doses are more advisable; large ones being apt to nauseate the stomach, and occasion violent constipations of the bowels. It is used also externally, in astringent and repellent lotions and collyria. Burnt alum taken internally has been highly extolled in cases of colic. In such instances, when taken to the extent of a scruple for a dose, it has been said gently to move the belly, and give very great relief from the severe pain.

Off. prep.—Alumen purif. *Lond.* Sulph. alum. exsicc. *Ed.* *Lond.* Dub. Solutio sulphat. cupri. comp. *Ed.* Aqua alum. comp. *Lond.* Pulv. comp. *Ed.* Cataplasma, *Lond.* Dub.

SULPHAS BARYTÆ. *Ed.* Terra ponderosa vitriolata, *Barytes.*

Sulphate of baryta. Ponderous spar.

THIS salt is found in great abundance in many countries, ei-

ther in a loose earthy form, or compact, or foliated, or striated, or acicular. The foliated is in general the purest. Its specific gravity is from 4.4 to 4.865. It is insoluble in water. It is soluble in boiling concentrated sulphuric acid. It decrepitates when suddenly heated. By being formed into a thin cake with flour and water, and being afterwards heated to redness, it becomes phosphorescent. Heated to redness with charcoal, it is converted into a sulphuret, and it may be decomposed either by boiling, or in a crucible, with the carbonates of potash and of soda. It contains about 84 of baryta, and 16 sulphuric acid and water.

Off. prep.—Murias barytæ, *Ed.*

SULPHAS MAGNESIÆ. *Ed. Magnesia Vitriolata. Lond. Dub. Sal catharticus amarus.*

Sulphate of magnesia. Epsom salt.

THIS salt is contained in several mineral springs, and also in sea water, from which it is obtained by evaporation. It crystallizes in tetrahedral prisms. It has a very bitter taste. It is soluble in its own weight of water at 60°, and three fourths of its weight of boiling water. Sulphate of magnesia, when perfectly pure, effloresces, but that of commerce generally contains foreign salts, such as the muriate of magnesia, which renders it so deliquescent that it must be kept in a close vessel or bladder. By the action of heat it undergoes the watery fusion, and loses its water of crystallization, but does not part with its acid. It is decomposed by baryta, strontia, the alkalies, and all the salts formed by these salifiable bases, excepting the alkaline muriates; and by the nitrate, muriate, and carbonate, of lime.

Medical use.—It is a mild and gentle purgative, operating with sufficient efficacy, and in general with ease and safety, rarely occasioning any gripes, sickness, or the other inconveniencies which resinous purgatives too often occasion. Six or eight drachms may be dissolved for a dose in a proper quantity of common water; or four, five, or more, in a pint, or quart of the purging mineral waters. These solutions may likewise be so managed as to promote evacuation by the other emunctories: if the patient be kept warm, they increase perspiration: and by moderate exercise in the cool air, the urinary discharge. Some allege this salt has a peculiar effect in allaying pain, as in colic, even independently of evacuation.

It is, however, principally used for the preparation of the carbonate of magnesia.

Off. prep.—Carbonas magnesiæ, *Ed.*

SULPHUR SUBLIMATUM. *Lond. Dub. Ed. Sulphuris Flores.*

Sublimed sulphur.

THE properties of sulphur have been already mentioned.

In the neighbourhood of volcanoes it is sometimes found perfectly pure and crystallized; but all the sulphur of commerce is extracted from pyrites by sublimation. It is usually brought to us in large irregular masses, which are afterwards melted and cast into cylindrical rolls, with the addition of some coarse resin, flour, or the like; whence the paler colour of the rolls.

Sulphur should be chosen of a bright yellow colour, should be very inflammable, and should burn with a bright pure blue flame. Sublimed sulphur is never prepared by the apothecary. It has the form of a very fine powder, having a beautiful yellow colour. It is often contaminated with a little sulphuric acid, formed during the process, from which it is easily freed by washing.

Medical use.—Sulphur stimulates the system, loosens the belly, and promotes the insensible perspiration: it seems to pervade the whole habit, and manifestly transpires through the pores of the skin, as appears from the sulphureous smell of persons who have taken it, and from silver being stained in their pockets of a blackish colour. In the stomach it is probably combined with hydrogen. It is a celebrated remedy against cutaneous diseases, particularly psoa, both given internally, and externally applied. It has likewise been recommended in rheumatic pains, flying gout, rickets, atrophy, coughs, asthmas, and other disorders of the breasts and lungs; and particularly in catarrhs of the chronic kind. In hæmorrhoidal affections it is almost specific; but in most of these cases it is advantageously combined with some cooling purgative, especially super-tartrate of potash.

Off. prep.—Sulph. sub. lot. *Ed. Lond. Dub.* Sulphas pot. cum sulph. *Ed.* Sulphur. pot. *Ed. Lond. Dub.* Hydro-sulph. ammon. *Ed.* Sulph. hydrarg. nigr. *Ed. Lond. Dub.* Hydrarg. sulph. rub. *Lond. Dub.* Oleum sulph. *Ed. Lond.* Petrol. sulph. *Lond.* Ungt. sulph. *Ed. Lond. Dub.*

SUPER-TARTRIS POTASSÆ. *Ed. Tartari Crystalli. Lond. Tartari crystalli et cremor dictum. Dub. Tartarus purificatus.*

Super-tartrate of potash, crystals of tartar, and cream of tartar.

SUPER-TARTRIS POTASSÆ IMPURUS. *Ed. Tartarum. Lond. Dub. Tartarus crudus.*

Impure super-tartrate of potash. Tartar.

TARTAR exists in verjuice and in must, and is deposited on the sides of the casks by repose, from which it is scraped some time before the next vintage, to prepare the casks to receive the new wine. The deepest coloured and coarsest wines generally give

most tartar; and it gets the name of white or red tartar according to its colour.

It is purified by dissolving it in boiling water, and separating the earthy part by filtrating the boiling solution. On cooling the solution, it deposits irregular crystals, containing the oily and colouring matters, which are separated by boiling the mass with a white clay. At Venice, it is purified by dissolving it in water, and clarifying it with whites of eggs and ashes. The tartar, thus purified, when crystallized, or in powder, is called Cream of Tartar.

Its crystals are small and irregular, and do not melt in the mouth, but feel gritty under the teeth. It has an acid harsh taste. It is soluble in sixty times its weight of water at 60°, and in thirty at 212°. It is decomposed, and its acid is destroyed, by heat. It contains 23 parts of potash, according to Bergmann, and 33, according to Thenard.

Medical use.—The virtues of tartar are those of a mild, cooling, aperient, laxative, medicine. It is much used in dropsy; and some allege that it has good effects as a deobstruent, in dropsy from scirrhus. Taken from half an ounce to an ounce, it proves a gentle, though effectual, purgative. Given in smaller doses, and in solution, it often acts as a powerful diuretic.

Off. prep.—Tartris potassæ, *Ed. Lond. Dub.* Tartris pot. et sodæ, *Ed. Lond. Dub.* Tartris ant. *Ed. Lond. Dub.* Ferrum tartarifat, *Lond.* Inf. fennæ tartar. *Lond.* Pulv. jalap. comp. *Ed.* Pulv. scam. comp. *Ed.* Pulv. fennæ comp. *Ed.*

SUS SCROFA. *Ed. Sus. Lond. Dub.*

Cl. *Mammalia*.—Ord. *Pachyderma*.

The hog.

Off.—Adeps, vulgo Axungia porcina. The fat. Hogs lard.

HOGS-LARD is a very pure animal fat, of a soft consistence. Hence it is emollient, and is a convenient article for the formation of ointments, plasters, and liniments.

Off. prep.—Adeps ppt. *Lond.* Ungt. adipis suill. *Lond.* Ungt. resin. *Ed.* Empl. canth. *Lond. Dub.* Ungt. hell. alb. *Dub.* Ungt. sulph. *Ed.* Ungt. acidi nitrosi, *Ed.* Ungt. hydrarg. *Ed. Lond. Dub.* Ungt. oxidi hydrarg. rubri, *Ed.* Ungt. nitrat. hydrarg. *Ed. Lond. Dub.* Ungt. infus. mel. vesic. *Ed.*

SWIETENIA.

Willd. g. 843. *Decandria Monogynia*.—Nat. ord. *Tribilata*.

Sp. i. SWIETENIA MAHAGONI. *Ed.*

Mahogany tree.

Off.—Cortex. The bark.

THIS majestic tree grows principally in Jamaica and in Spanish America. Its useful wood is universally known. Its bark is brown, rough, and scaly; on the branches grey and smoother. Its taste is very astringent, and bitterer than that of Peruvian bark. Its smell weak and aromatic. In its properties and action on the living body, it coincides nearly with Peruvian bark, and may be substituted for it in many situations.

Sp. 2. SWIETENIA FEBRIFUGA. Ed.

Febrifuge Swietenia.

Off.—Cortex. The bark.

THIS species, which in many respects resembles the former, is a native of the East Indies. Its bark is red, brittle, and compact, and covered with a rough grey cuticle. In its properties it agrees with the mahogany bark, and forms a very valuable substitute for Peruvian bark in the East Indies, where this last is so dear and scarce, and the diseases in which it is indicated so common. It is, however, merely an astringent bitter, and contains no cinchonin. Dr. Roxburgh sent from India a quantity of the extract of this bark, which could not be distinguished from the kino of the shops.

TAMARINDUS INDICA. *Ed. Tamarindus. Lond. Dub.*

Willd. g. 1250, sp. 1. Monadelphia Triandria.—Nat. ord. *Legumentaceæ.*

Tamarind tree.

Off.—Fructus conditus. The preserved fruit.

THIS tree grows both in the East and West Indies. The fruit is a broad ash-coloured pod. The external covering is thin and brittle, and contains several hard seeds, enveloped in a soft brown pulp. Tamarinds are cured in two ways. The common way is to throw hot sugar from the boilers on the ripe pulp; but a better method is to put alternate layers of tamarinds and powdered sugar in a stone jar. By this means the tamarinds preserve their colour, and taste more agreeably.

East-India tamarinds are longer than the West-India sort; the former containing six or seven seeds each, the latter rarely above three or four.

Preserved tamarinds should be fresh and juicy, and should have an agreeable acid taste. They should not have a musty smell; the seeds should not be soft and swollen, and the blade of a knife should not get a coating of copper by being immersed amongst them.

Tamarinds contain sugar, mucilage, citric acid, super-tartrate of potash, tartarous acid, and malic acid.

Medical use.—The pulp of these fruits, taken in the quantity of from two or three drachms to an ounce or more, proves gently laxative and purgative; and at the same time, by its acidity, quenches thirst, and allays immoderate heat. It increases the action of the purgative sweets, cassia and manna, and weakens that of the resinous cathartics.

Salts, whose base is potash, form an improper addition to tamarinds, for they are decomposed, and the tartarous acid of the fruit is precipitated in the form of super-tartrate of potash.

Off. prep.—Inf. cum fenna, *Ed.* Elect. cassiæ, *Ed. Lond. Dub.* Elect. fennæ, *Ed. Lond.*

TANACETUM VULGARE. *Ed. Tanacetum. Folia. Dub. Lond.*

Willd. g. 1472, sp. 18. Syngenesia superflua.—Nat. ord. *Compositæ discoidea.*

Tansy.

Off.—Folium, Flos. The flower and leaves.

TANSY is perennial, and grows wild by road-sides and the borders of fields, and is frequently also cultivated in gardens, both for culinary and medicinal uses: it flowers in June and July.

Medical use.—Considered as a medicine, it is a moderately warm bitter, accompanied with a strong, not very disagreeable flavour. Some physicians have had a great opinion of it in hysteric disorders, particularly those proceeding from a deficiency or suppression of the uterine purgations. The leaves and seeds have been of considerable esteem as anthelmintics; the seeds are less bitter, and more acrid and aromatic than those of rue, to which they are reckoned similar; or of santonicum, for which they have been frequently substituted. An infusion of tansy, drunk in a manner similar to tea, has been strongly recommended as a preventive of the return of gout.

TEUCRIUM.

Willd. g. 1093. Didynamia Gymnospermia.—Nat. ord. *Verticillata.*

Sp. 12. TEUCRIUM MARUM. Marum Syriacum. Lond. Dub.
Syrian herb mastich.

Off.—Herba. The herb.

THIS is a small shrubby plant, growing spontaneously in Syria, Candy, and other warm climates, and cultivated with us in gardens. The leaves have an aromatic bitterish taste; and, when rubbed betwixt the fingers, a quick pungent smell, like volatile alkali, which soon affects the head, and occasions sneezing: dis-

tilled with water, they yield a very acrid, penetrating essential oil, resembling that of scurvy-grass. These qualities sufficiently point out the uses to which this plant might be applied : at present it is little otherwise employed than in cephalic snuffs.

Off. prep.—Pulv. asari comp. *Ed. Lond. Dub.*

Sp. 34. TEUCRIUM SCORDIUM. *Scordium. Lond.*

Water germander.

Off.—Herba. The herb.

THIS is a small, somewhat hairy, perennial plant, growing wild in some parts of England, though not very common : the shops are generally supplied from gardens. It has a bitter taste, and a strong disagreeable smell.

Off. prep.—Catap. cumini, *Lond.*

TOLUIFERA BALSAMUM. *Ed. Balsamum Tolutanum. Lond. Dub.*

Willd. g. 828, *sp.* 1. *Decandria Monogynia.*—*Nat. ord. Lomentaceæ.*

Balsam of Tolu.

Off.—Balsamum. The balsam.

THIS tree grows in Spanish America, and the balsam flows from incisions made in its bark, during the hot season, and is brought to us in little gourd shells. It is of a yellowish-brown colour, inclining to red : in consistence thick and tenacious : by age it grows hard and brittle, without suffering any great loss of its more valuable parts. The smell of this balsam is extremely fragrant, somewhat resembling that of lemons ; its taste warm and sweetish. Lewis says that he has sometimes procured benzoic acid from it. It yields very little volatile oil, although it impregnates the distilled water strongly with its flavour. By dissolving a proper quantity of sugar in this water, a syrup is obtained, greatly superior to that prepared in the common way, with a decoction of the balsam.

In its medical virtues it agrees with the other balsams.

Off. prep.—Syr. *Lond.* Tinct. *Ed. Lond. Dub.* Tinct. benz. comp. *Lond. Ed.*

TORMENTILLA ERECTA. *Ed. Tormentilla. Lond. Dub.*

Willd. g. 1001, *sp.* 1. *Icosandria Polygynia.*—*Nat. ord. Senticosæ.* Septfoil.

Off.—Radix. The root.

TORMENTIL is perennial, and found wild in woods and on commons : it has long slender stalks, with usually seven long narrow leaves at a joint ; the root is for the most part crooked and

knotty, of a blackish colour on the outside, and a reddish within. This root has an austere styptic taste, accompanied with a slight kind of aromatic flavour: it is one of the most agreeable and efficacious of the vegetable astringents, and is employed with good effect in all cases where medicines of this class are proper. Neumann got from 960 grains, 365 alcoholic, and 170 watery extract; and inversely, 570 watery and 8 alcoholic.

Off. prep.—Pulv. cret. comp.

TRIGONELLA FOENUM GRÆCUM. *Foenum Græcum.*
Lond.

Diadelphia Decandria.—Nat. ord. *Papilionaceæ.*
Fenugreek.

Off.—Semen. The seeds.

This plant is annual, and a native of the south of France. In Poland it is cultivated in large quantities. The seeds have a yellowish colour, a rhomboidal figure, a disagreeable strong smell, and a mucilaginous taste. Their principal use was in cataplasms, fomentations, and the like, and in emollient glysters. Neumann got from 7680 parts, 620 bitter watery, and 30 unctuous alcoholic extract; and inversely, 270 very ungrateful alcoholic, and 390 watery. The distilled water had a slight smell of fenugreek, which it soon lost.

TRITICUM.

Willd. g. 152. *Triandria Monogynia.*—Nat. ord. *Gramina.*

Sp. 1. **TRITICUM ÆSTIVUM.** *Dub.*

Sp. 2. **TRITICUM HYBERNUM.** *Lond.*

Wheat.

Off.—Farina, amyllum. Flour, starch.

By some these are considered only as varieties of wheat, not as distinct species. The latter, however, is the most productive, and is most commonly cultivated on that account; for there is no material difference between the grains they produce, which are indiscriminately employed for every purpose.

Wheat-flour consists principally of gluten, starch, albumen, and a sweet mucilage. These may be separated by forming the flour into a paste with a little water, and washing this paste with fresh quantities of water, until it runs from it colourless. What remains is the gluten; which, if not the same, is very analogous to the fibrine of animal substances. From the water with which the paste was washed, a white powder, *Amyllum*, separates on standing. The albumen and sweet mucilage remain dissolved in the water. By evaporating it, the albumen first separates in

white flakes, and the sweet mucilage may be got by total evaporation.

It is the presence of gluten which characterizes wheat flour; and on the due admixture of it with the other constituents depends the superiority of wheat flour for baking bread.

Bread is made by working the flour into a paste with water, a quantity of some ferment, such as yeast, and a little muriate of soda to render it sapid, allowing the paste to stand until a certain degree of fermentation take place, and then baking it in an oven heated to about 488°. During the fermentation a quantity of gas is formed, and as it is prevented from escaping by the toughness of the paste, and dilated by the heat of the oven, the bread is rendered light and spongy. In this process the nature of the constituents of the flour is altered, for we are not able to obtain either gluten or starch from bread.

Medical use.—Bread is not only one of the most important articles of nourishment, but is also employed in pharmacy for making cataplasms, and giving form to more active articles. An infusion of toasted bread has a deep colour and pleasant taste, and is an excellent drink in febrile diseases, and debility of the stomach.

AMYLUM EX TRITICO PREPARATUM.

Wheat starch.

THE Edinburgh college have inserted starch as a separate substance in their catalogue of the materia medica, probably considering it to be a general principle common to many vegetables, although they point out the particular species which they wish to be employed.

The general properties of starch have been already enumerated. It is found in many vegetables, combined with different substances. Fourcroy, accordingly, makes various species of it; as, combined,

1. With gluten or fibrine; as in wheat, rye, and other similar feeds.
2. With extractive; as in beans, peas, lupins, &c.
3. With mucilaginous matters; as in the potatoe, and many other roots, in unripe corn.
4. With saccharine matter; in most roots, and in corn after it has begun to germinate.
5. With oil; in the emulsive seeds, almonds, &c.
6. With an acrid principle; as in the root of the burdock, jatropha manihot, arum, asarum, and other tuberous roots.

Medical use.—As a constituent of many vegetable substances, it forms a most important alimentary substance. In a medical point of view, it is to be considered as a demulcent; and accordingly, it forms the principal ingredient of an officinal lozenge, and a mucilage prepared from it often produces excellent effects, both taken by the mouth, and in the form of a clyster in dysentery and diarrhoea, from irritation of the intestines.

Off. prep.—Mucilago amyli, *Ed. Lond.* Trochisci gummosi, *Ed. Lond.* Pulv. trag. comp. *Lond.* Pil. hydrarg. *Ed.*

TUSSILAGO FARFARA. *Ed.* *Tussilago.* *Lond. Dub.*

Willd. g. 1483, *sp.* 12. *Syngenesia superflua.*—*Nat. ord. Compositæ radiatæ.*

Colts foot.

Off.—Folium, flos. The herb and flowers.

THIS grows wild in moist situations, producing yellow flowers in February and March: these soon fall off, and are succeeded by large roundish leaves, hairy underneath: their taste is herbaceous, somewhat glutinous and subacid.

Med. use.—Colts foot is recommended in coughs, phthisis, and other disorders of the breast and lungs, and some use it in scrofula. Its effects probably depend more on the milk in which it is commonly directed to be taken, than on the tussilago itself.

ULMUS CAMPESTRIS. *Ed.* *Ulmus.* *Lond. Dub.*

Willd. g. 505, *sp.* 1. *Pentandria Digynia.*—*Nat. ord. Scabridæ.*
Elm tree.

Off.—Cortex interior. The inner bark.

THIS tree grows wild in Britain. The inner bark has a yellowish colour, and a mucilaginous, bitter, astringent taste, without smell.

In decoction it has been highly recommended in the lepra ichthyosis, and has been said to cure dropsies, but it requires a patient trial.

Off. prep.—Decoct. *Lond.*

URTICA DIOICA. *Urtica.* *Lond.*

Monoecia Tetrandria.—*Nat. ord. Scabridæ.*
Common nettle.

Off.—Herba. The plant.

THIS is a well known perennial weed. The leaves of the fresh plant stimulate, inflame, and blister the skin. Hence stinging with nettles has been recommended as a powerful rubefacient, and has been alleged to have sometimes succeeded in restoring sense and motion to paralytic limbs, and in cases of torpor.

VALERIANA OFFICINALIS. *Ed. Valeriana sylvestris.*
Lond. Dub.

Willd. g. 75, sp. 6. Triandria Monogynia.—Nat. ord. *Aggregata.*

Wild valerian.

Off.—Radix. The root.

THIS plant is perennial, and grows wild in Britain. Like many other plants, it varies in its appearance and sensible qualities, according to the situation in which it grows. In marshes and shady places its leaves are broader, on dry heaths and high pastures they are narrower.

The roots produced in low watery grounds have a remarkably faint smell in comparison of the others, and sometimes scarcely any. The roots taken up in autumn or winter, have also much stronger sensible qualities than those collected in spring and summer.

The root consists of a number of strings or fibres matted together, issuing from one common head, of a whitish, or pale brownish colour. Its smell is strong, like a mixture of aromatics with fetids; the taste unpleasantly warm, bitterish, and subacid. Neumann got from 480 grains of the dry root 186 alcoholic, and 74 watery extract; and inversely, 261 watery and 5 alcoholic. The distilled alcoholic was slightly, the water strongly, impregnated with the smell of the valerian, but no separable oil was obtained.

Med. use.—Wild valerian is a medicine of great use in nervous disorders; and is particularly serviceable in epilepsies proceeding from a debility of the nervous system.

Some recommend it as useful in procuring sleep, particularly in fever, even when opium fails; but it is principally useful in affections of the hysterical kind.

The common dose is from a scruple to a drachm in powder; and in infusion, from one to two drachms. Its unpleasant flavour is most effectually concealed by a suitable addition of mace.

As its virtues reside entirely in an essential oil, the decoction and watery extract are improper forms for exhibiting it.

Off. prep.—Tinct. *Lond.* Tinct. ammon. *Lond. Dub.* Extract. *Dub.*

VERATRUM ALBUM. *Ed. Helleborus albus. Lond. Dub.*
Polygamia Monoecia.—Nat. ord. *Liliaceae.*

White hellebore.

Off.—Radix. The root.

THIS plant grows spontaneously in Switzerland and the mountainous parts of Germany. The root has a nauseous, bitterish, acrid taste, burning the mouth and fauces. If wounded when

fresh, it emits an extremely acrimonious juice, which, when inserted into a wound, is said to prove very dangerous. Neumann got from 960 grains 560 watery and 10 alcoholic extract; and inversely, 420 alcoholic and 180 watery. Nothing rose in distillation.

Med. use.—The powder of the dried root, applied to an issue, occasions violent purging; snuffed up the nose, it proves a strong, and not always a safe, sternutatory. Taken internally, it acts with extreme violence as an emetic; and has been observed, even in a small dose, to occasion convulsions, and even death. The ancients sometimes employed it in very-obstinate cases, and always made this their last resource. Modern practice seems to have almost entirely rejected its internal use, though some have ventured upon so large a dose as a scruple, in maniacal cases, and are said to have experienced good effects from it.

Off. prep.—Decoct. Lond. Tinct. Ed. Ungt. Lond. Dub.

VERONICA BECCABUNGA. *Beccabunga. Lond. Dub.*

Willd. g. 44, sp. 30. Diandria Monogynia.—Nat. ord. *Personate.*

Brooklime.

Off.—Herba. The herb.

THIS is a low perennial plant, common in little rivulets and ditches of standing water. The leaves remain all the winter, but are in greatest perfection in the spring. Their prevailing taste is an herbaceous one, accompanied with a very light bitterness.

If any good effects be expected from brooklime, it should be used as food.

Off. prep.—Succus coch. comp. Lond.

VIOLA ODORATA. *Ed. Viola. Lond. Dub.*

Willd. g. 446, sp. 12. Pentandria Monogynia.—Nat. ord. *Campanaceæ.*

March violet.

Off.—Flos. The recent flower.

THIS plant is perennial, and is found wild under hedges and in shady places; but the shops are generally supplied from gardens. Its flowers are so remarkable for their delightful odour and their peculiar richness of colour, that they have given a name to both.

In our markets we meet with the flowers of other species: these may be distinguished from the foregoing by their being larger, of a pale colour, and having no smell.

Med. use.—They impart their colour and flavour to aqueous liquors: a syrup made from the infusion has long maintained a

place in the shops, and is said to be an agreeable and useful laxative for children; but is chiefly valued as a delicate test of the presence of uncombined acids or alkalies, the former changing its blue to a red, and the latter to a green colour.

Off. prep.—Syr. violæ odorat. *Ed. Lond. Dub.*

VITIS VINIFERA. *Ed. Vitis. Lond. Dub.*

Willd. g. 453, sp. 1. Pentandria Monogynia.—*Nat. ord. Hederaceæ.*

The vine.

THE vine grows in temperate situations in many parts of the world, and is cultivated very generally for the sake of its agreeable subacid fruit. Before they are ripe, grapes are extremely harsh and acid, and by expression furnish a liquor which is called Verjuice. It contains malic acid, super-tartrate of potash, and extractive, and may be made to furnish wine by the addition of sugar. As the grape advances to maturity, the quantity of sugar increases, while that of malic acid diminishes: it however never disappears entirely. When thoroughly ripe, the grape is one of the most agreeable fruits. It is cooling, antiseptic, and nutritious, and, when eaten in considerable quantity, diuretic, and gently laxative. In inflammatory diseases, and all others where acids are indicated, they form an excellent article of diet.

FRUCTUS SICCATUS. *Uva passa.*

Raisins.

RAISINS, are grapes which have been carefully dried. By this means not only the water they contained is dissipated, but the quantity of acid seems to be diminished. They become more saccharine, mucilaginous, and laxative, than the recent grape, but are less cooling.

Off. prep.—Decoct. alth. off. *Ed.* Decoct. guiac. comp. *Ed.* Decoct. hord. comp. *Lond.* Tinct. card. comp. *Lond. Dub.* Tinct. fennæ, *Lond. Dub.*

FRUCTUS SUCCUS FERMENTATUS. Vinum album Hispanum, Vinum album Rhenanum, Vinum rubrum Lusitanicum.

Sherry, Hock, Port.

WINE is the juice of the grape altered by fermentation. The numerous varieties of wine depend principally on the proportion of sugar contained in the must, and the manner of its fermentation. When the proportion of sugar is sufficient, and the fermentation complete, the wine is perfect and generous: if the quantity of sugar be too large, part of it remains undecomposed, as the

fermentation is languid, and the wine is sweet and luscious; if, on the contrary, it be too small, the wine is thin and weak; and if it be bottled before the fermentation be completed, it will proceed slowly in the bottle, and on drawing the cork the wine will froth and sparkle in the glass, as for example, Champagne. When the must is separated from the husk of the grape before it is fermented, the wine has little or no colour; these are called White wines. If, on the contrary, the husks are allowed to remain in the must while the fermentation is going on, the alcohol dissolves the colouring matter of the husks, and the wine is coloured, such are called Red wines. Besides in these principal circumstances, wines vary very much in flavour. The red wines most commonly drunk in this country are Port, which is strong and austere, containing much tannin, and Claret, which is thinner and higher flavoured. Our white wines are all strong, Madeira, Sherry, Lisbon, Malaga, and Hock. Of these the last is the most acidulous, and Malaga the sweetest.

Med. use.—Wine, taken in moderate quantities, acts as a beneficial stimulus to the whole system. It promotes digestion, increases the action of the heart and arteries, raises the heat of the body, and exhilarates the spirits. Taken to excess, it produces inebriety, which is often succeeded by headach, stupor, nausea, and diarrhoea, which last for several days. Habitual excess in wine debilitates the stomach, produces inflammation of the liver, weakens the nervous system, and gives rise to dropsy, gout, apoplexy, tremors, and cutaneous affections.

To convalescents, and in all diseases of general debility, and deficiency of the vital powers, wine is the remedy on which we must place our chief dependance; and when properly administered, its effects are often scarcely credible.

The use of wine as an article of pharmacy, will be noticed hereafter.

WINTERA AROMATICA. *Ed.*

Willd. g. 1063. *Polyandria Tetragynia*.—*Nat. ord. Oleracea.*

Winters bark.

Off.—Cortex, vulgo Winteranus cortex.

This is the produce of a tree growing about the southern promontory of America. It was first discovered on the coast of Magellan by Captain Winter, in the year 1567. The sailors then employed the bark as a spice, and afterwards found it serviceable in the scurvy; for which purpose it is at present also sometimes made use of in diet drinks. The true Winters bark is not often met with in the shops, Canella alba being generally substituted for it, and by some they are reckoned to be the same: there is, how-

ever, a considerable difference betwixt them in appearance, and a greater in quality. The Winters bark is in large pieces, of a more cinnamon colour than the canella, and tastes much warmer and more pungent. Its smell resembles that of cascarilla. Its virtues reside in a very hot, stimulant, volatile oil.

ZINCUM. *Ed. Dub. Lond.*

Zinc.

THE general properties of zinc have been already noticed.

It is always found oxidized,

1. Combined with a greater or less proportion of carbonic acid. Calamine.
2. Combined with sulphur. Blende.
3. Combined with sulphuric acid, generally in solution.

The ores of zinc are rarely worked by themselves, or with the sole intention of extracting zinc, but are generally melted with the lead ores, particularly galena, which they commonly accompany. By this process the zinc is obtained in two forms; part of it is sublimed in the state of an oxide, and attaches itself to the chimney of the furnace, in the form of a grey, granular, earthy-like, incrustation, which is known by the name of tutty or cadmia; part of it is sublimed in its metallic form, and is condensed in the throat of the chimney in small grains, which are afterwards melted in a crucible, and cast in ingots.

Off. prep.—Oxidum zinci, *Ed. Lond. Dub.* Sulphas zinci, *Ed. Lond. Dub.*

OXIDUM ZINCI IMPURUM. *Ed. Tutia. Lond. Dub.*

Impure oxide of zinc. Tutty.

IT is moderately hard and ponderous; of a brownish colour and full of small protuberances on the outside, smooth and yellowish within; some pieces have a bluish cast, from minute globules of zinc in its metallic form. Tutty is celebrated as an ophthalmic, and frequently employed as such in unguents and collyria.

Off. prep.—Oxidum zinci imp. ppt. *Ed. Lond.* Ungt. *Ed. Lond. Dub.*

CARBONAS ZINCI IMPURUS. *Ed. Lapis Calaminaris. Dub. Lond.*

Impure carbonate of zinc. Calamine.

THIS mineral is found plentifully in England, Germany, and other countries, either in distinct mines, or intermingled with the

ores of different metals. It is usually of a greyish, brownish, yellowish, or pale reddish colour, without lustre or transparency; fracture commonly uneven or earthy; considerably hard, though not sufficiently so as to strike fire with steel. Before the blow-pipe it decrepitates, but does not melt, and becomes yellower, and is sublimed. It is partly soluble in acids, and often effervesces with them.

Mr. Smithson has analysed several varieties of Calamine.

	Sp. Grav.	Ox. of Zinc.	Carb. Acid.	Water.	Quartz.
Derbyshire	4.333	65.2	34.8		
Somersetshire	4.336	64.8	35.2		
Carinthia	3.598	71.4	13.5	15.1	
Hungary	3.434	68.3		4.4	25.
Fribourg		38.		12.	50.

Calamine is generally roasted before it comes into the shops, to render it more easily reducible into a fine powder. In this state it is employed in collyria, against defluxions of thin acrid humours upon the eyes, for drying up moist running ulcers, and healing excoriations.

Off. prep.—Cerat. *Ed. Lond. Dub.* Carb. zinci imp. ppt. *Ed. Lond. Dub.*

SULPHAS ZINCI. *Vitriolum album. Lond. Dub.*

Sulphate of zinc. White vitriol.

THIS is chiefly found native in the mines of Goslar, sometimes in transparent pieces, but more commonly in the form of white efflorescences, which are dissolved in water, and afterwards reduced by evaporation and crystallization into large masses. But as native sulphate of zinc is seldom pure, it is ordered to be prepared.

Med. use.—White vitriol is sometimes given, from five or six grains to half a drachm, as an emetic; it operates very quickly, and, if pure, without violence. Externally, it is employed as an ophthalmic, and is often made the basis of collyria, both in extemporaneous prescription and in dispensatories.

APPENDIX.

No. 1.

List of Substances contained in some of the latest and most esteemed Foreign Pharmacopœias, but not inserted in the Materia Medica of any of the British Colleges.

EXPLANATION OF THE ABBREVIATIONS.

- Roff.—Pharmacopœia Rossica. 8vo. Petropoli, 1798.
- Aust. prov.—Pharmacopœia Austriaco-provincialis, emendata. 8vo. Viennæ, 1794.
- Aust. cast.—Pharmacopœia Austriaco-castrensis. 8vo. Ticini, 1795.
- Brem.—Pharmacopœia in usum officinarum reipublicæ Bremensis conscripta. 8vo. Bremæ, 1792.
- Bor.—Pharmacopœia Borussica. 4to. Berolini, 1799.
- Gen.—Formulario Farmaceutico per uso dell' Ospedale di Pamatone. 8vo. Geneva, 1800.
- Mar.—Apparatus medicaminum nosocomiis, generatim curationi ægrotorum pauperum maxime accomodus Francisci Marabelli. 8vo. Bataviæ, anno Reipub. Gall. VIto. 1798.
- Van M.—Pharmacopée manuelle, par J. B. Van Mons. 8vo. A Bruxelles, an. IX. 1801.
- La G.—Manuel du Pharmacien par E. J. B. Bouillon La Grange. 8vo. A Paris, an. XI. 1803.
- Parm.—Code Pharmaceutique, a l'usage des hospices civiles, des secours a domiciles, et des prisons, publié par ordre du Ministre de l'interieur. Par A. A. Parmentier. 8vo. Paris, 1803.

ACHILLEA MILLEFOLIUM. *Millefolii herba, flores.* Ross.
Aust. prov. Brem. Bor. La G.

Smell somewhat aromatic; taste slightly astringent and bitterish; effects stomachic and tonic.

ACHILLEA NOBILIS. *Millefolii nobilis herba, flores.* Ross.

Smell camphoraceous and aromatic, preferable in every respect to the preceding species.

ACHILLEA PTARMICA. *Ptarmicæ radix; herba cum floribus.* Ross.

No smell; taste acrid; effects sialogogue, sternutatory.

ADIANTUM CAPILLUS VENERIS. *Capillus veneris; herba.* Aust. prov. Van M. La G.

Used for preparing the syrup called Capillaire.

AGARICUS MUSCARIUS. Ross.

Smell fetid; taste acrid; effects inebriating, and inducing delirium.

AGRIMONIA EUPATORIA. *Agrimonia; herba.* Aust. prov. Brem. La G.

Slightly styptic and astringent.

ALCEA ROSEA. *Malvæ arboreæ flores.* Ross. Brem. Bor.

No smell; taste mucilaginous and sub-astringent; effects emollient and sub-astringent.

AMBRA AMBROSIACA GRYSEA. *Ambra grysed.* Ross. Bor. Van. M.

Smell agreeable; taste resinous and aromatic; effects exciting and augmenting the nervous power.

AMOMUM CURCUMA. Van M. *Curcuma radix* Bor.
Taste bitterish, aromatic.

AMOMUM GRANA PARADISI. *Grana paradisi.* Brem. La G.

Smell slightly aromatic; taste acrid; effects stimulating.

AMYGDALUS NANA. *Nuclei.* Ross.

No smell; bitterish taste; a substitute for sweet almonds.

AMYGDALUS PERSICA. *Flores.* Van M. La G.
Aromatic ; bitter ; laxative.

ANAGALLIS ARVENSIS. *Anagallis. Herba.* Aust. prov.
Brem. Ross. Bor.

No smell ; taste at first herbaceous, afterwards bitter, and somewhat acrid.

ANEMONE PRATENSIS. *Pulsatilla nigricantis herba.*
Ross. Aust. prov. Brem.

Smell slight ; taste acrid, caustic, durable ; effects diuretic and stimulant.

ANEMONE NEMOROSA. *Ranunculi albi flores, et herba recens.* Ross.

Smell slight ; taste acrid ; effects rubefacient and blistering.

ANTIRRHINUM LINARIA. *Linaria.* Aust. prov. Brem.
Bor.

Smell urinous ; taste bitterish ; effects diuretic.

ARISTOLOCHIA CLEMATITIS. *Aristolochia vulgaris.*
Radix. Ross.

Smell fragrant, but heavy ; taste bitter, durable ; effects diuretic, emmenagogue.

ARISTOLOCHIA LONGA. *Radix.* La G.

ARISTOLOCHIA ROTUNDA. *Radix.* Brem. Bor.
La G.

Smell, taste, and effects similar to those of the preceding species.

ARISTOLOCHIA TRILOBATA. *Stipites ; radix.* Ross.

Smell fragrant, strong ; taste bitterish, corresponding with the smell ; effect diaphoretic.

ARTEMISIA PONTICA. *Absointhium ponticum ; herba.*
Aust. prov.

Similar to A. absointhium, but weaker.

ASCLEPIAS VINCETOXICUM. *Radix.* La G.
Stimulant cordial ; diaphoretic.

ASPARAGUS SATIVA. *Radix.* La G.

Taste bitter-sweet ; mucilaginous ; aperitive, imparting its smell to the urine.

ASPLENIUM SCOLOPENDRIUM. *Folia.* Van M.
Sub-astringent.

ASTRAGALUS EXSCAPUS. *Radix.* Ross. Aust. prov.
Brem.

No smell; taste bitterish and sub-astringent; effects demulcent, and falsely supposed anti-syphilitic.

AURUM. La G.

BELLIS PERENNIS. *Flos. Folium.* Aust. prov.
No smell; taste slightly acrid.

BETONICA OFFICINALIS. *Folia.* La G.
Aperitive.

BETULA ALNUS. *Alni folia.* Ross.
No smell; taste astringent and bitterish; effects discutient and vulnerary.

BISMUTHUM, vulgo MARCASITA. Bor.
A very brittle, fusible, and volatile metal. When dissolved in nitric acid, it is precipitated in the form of a white oxide by water,

BITUMEN ASPHALTUM. *Asphaltum.* Bor.
A black friable bitumen, shining in its fracture.

BOLETUS LARICIS. *Agaricus albus. Agaricus chirurgorum.* Brem. Aust. prov. Bor. Van M. La G.
Taste nauseous and bitter; effects emetic, cathartic, drastic.

BOLETUS SALICIS. Bor.
An unequally porous fungus growing on the willow, and diffusing an aromatic smell, especially after rain.

BOLUS ALBA. Aust. prov.

BOLUS ARMENA. Aust. prov. Bor. Van M.
No smell; adheres to the tongue; effects exsiccative.

BORAGO OFFICINALIS. *Folia, flores.* Van M. La G.
Saline; aperitive.

BOS TAURUS. *Lac vaccinum.* Aust. prov. Gen. Bor.
Van M.
Nutritious; demulcent.

Serum lactis vaccini. Mar.

Attenuant; antiseptic.

Saccharum lactis. Bor.

Nutritious; demulcent.

Butyrum. Van M.

Unctuous.

Sevum Bovinum. Ross. Aust. cast.

Unctuous, emollient.

Fel tauri. Bor. Mar. Van M.

Stomachic.

BRASSICA (ERUCA). *Eruca semina.* Ross. Bor.]

Smell heavy; taste acrid; effects stimulant.

BRUNELLA VULGARIS. *Folia.* La G.

Vulnerary; astringent.

BUBON MACEDONICUM. *Semina.* La G.

Acrid; aromatic.

BUGLOSSUM OFFICINALE. *Folia, flores.* La G.

Demulcent.

CALENDULA OFFICINALIS. *Calendula.* Aust. prov.
Van M

Taste bitterish.

CANNABIS SATIVA. *Cannabis. Semina.* Ross. Brem.
Bor. Van M.

Smell weak; taste mawkish; effects emollient, anodyne.

CARBO. Van M.

Antiseptic; disoxygenizing.

CARDUUS MARIANUS. *Carduus Mariæ. Semen.* Brem.

Emulsive.

CAREX ARENARIA. *Radix.* Ross. Bor.

Smell agreeable, but not strong; effects demulcent, resolvent.

CARLINA ACAULIS. *Carlina, seu Cardopathiæ Radix.*
Bor. La G.

Taste very acrid and bitter; smell somewhat aromatic, but
nauseous.

CARTHAMUS TINCTORIUS. *Grana.* La G.
Cathartic.

CERATONIA SILIQUA. *Siliqua dulcis.* Ross. Aust.
prov. Brem. Bor.

No smell; taste sweet; effects edulcorant, expectorant.

CHELIDONIUM MAJUS. *Radix, herba recens.* Ross.
Aust. prov. Brem.

Smell heavy; taste acrid, bitterish, durable; effects acrid, purgative; when dried, aperient, diuretic.

CHENOPODIUM AMBROSIODES. *Chenopodii herba.*
Brem. Bor. Van M.

Smell strong, fragrant; taste acrid, aromatic; effects stimulant, carminative, anthelmintic.

CHENOPODIUM BOTRYS. *Botrys vulgaris.* *Herba.*
Ross. Van M.

Qualities and effects similar to, but stronger than, those of the preceding species.

CICHORIUM INTYBUS. *Cichorii radix, herba.* Ross.
Aust. prov. et cast. Brem. La G. Van M. Gen. Bor. Mar.

No smell; taste of the herb agreeably bitter, of the root intensely bitter; effects aperient, tonic, diuretic.

CICUTA VIROSA. *Herba.* Bor.

Smell heavy; narcotic.

CLEMATIS ERECTA. *Flammula Jovis folia, flores.* Ross.
Aust. prov. Bor. Van M.

Smell weak; taste acrid, blistering; effects diuretic, sudorific.

COLUBER VIPERA. La G.

Nutritious.

CONFERVA DICHOTOMA. *Fucus helminthocortos.* *Helminthocorton.* Ross. Brem. Gen. Bor. Mons.

Smell marine, fetid; taste saline; effects purgative, anthelmintic.

CONVALLARIA MAJALIS. *Liliorum convallium flores.*
Bor. Mons. La G.

Aromatic; cephalic.

CONVOLVULUS AMERICANUS. *Mechoacanba; radix.*
Brem. La G.

Taste at first sweetish, then subacid; effect purgative.

CONVOLVULUS TURPETHUM. *Radix.* Van M.
Cathartic.

CORDIA MYXA. *Fruſtus.* La G.
Pectoral.

CUCUMIS MELO. *Melo. Semen.* Auſt. prov. Bor.
Emulſive.

CUCURBITA PEPO. *Pepo. Semen.* Auſt. prov.
Emulſive.

CYCAS CIRCINALIS. *Sago grana.* Roſſ. Brem.
Amylaceous; nutritious.

CYNOGLOSSUM OFFICINALE. *Radix.* Van M. La G.
Aſtringent; inſpiſſant.

CYNOMORIUM COCCINEUM. *Fungus Melitenſis.* Roſſ.
No ſmell; taſte ſtyptic, bitteriſh, ſaline; effects roborant,
aſtringent.

CYTINUS HYPOCISTIS. *Hypociftis. Succus inſpiſſatus.*
Auſt. prov.
Taſte acrid, auſtere; effect aſtringent.

DICTAMNUS ALBUS. *Radix.* Auſt. prov. Brem. Bor.
La G.
Smell fragrant; taſte bitter, ſub-aromatic; effects tonic, an-
thelmintic.

DIGITALIS EPIGLOTTIS. *Folia.* Gen.
An Italian ſubſtitute for the D. propurea.

EPIDENDRUM VANILLA. *Vanilla ſiliqua.* Roſſ. Van
M. La G.
Smell fragrant, baſamic; taſte aromatic, ſub-acid, unctuous;
effects heating, diuretic.

ERINGIUM CAMPESTRE. *Radix.* La G.
Aperitive; diuretic.

ERYSIMUM OFFICINALE. *Eryſimum. Herba.* Brem.
La G.
Taſte acrid; effects aſtringent, diuretic.

EUPATORIUM CANNABINUM. *Folia.* Van M.
Smell acrid, penetrating; taſte intenſely bitter; diuretic;
emetic; cathartic.

EUPHORBIA OFFICINALIS. *Euphorbii gummi.* Ross.
Aust. prov. Ber. Van M.

No smell; taste at first none, then pungent, burning; effects acrid, drastic.

EUPHRASIA OFFICINALIS. *Herba.* Van M. La G.
Ophthalmic.

FAGARA OCTANDRA. *Tacamahaca.* *Gummi-resina.*
Ross. Bor.

Smell fragrant like lavender; taste bitterish, nauseous; effects tonic, stimulant.

FICUS INDICA RELIGIOSA. *Lacæ gummi.* Ross. Brem.
Bor.

Resinous.

FORMICA RUFA. *Formicæ cum acervo.* Ross. Brem. Bor.
Qualities and effects depend on the little acetous acid they contain.

FRAGARIA VESCA. *Radix.* Van. M.
Refrigerant; diuretic.

GADUS LOTA. *Mustela fluviatilis.* *Liquamen hepatis.*
Aust. prov.
Detergent; solvent.

GENTIANA PANNONICA. *Gentiana.* *Radix.* Aust.
prov. et cast.

Qualities and effects the same as those of the gentiana lutea.

GEUM RIVALE. *Gei palustris radix.* Ross.
Smell weak; taste styptic, austere; effects tonic, astringent, febrifuge.

GEUM URBANUM. *Caryophyllatæ radix.* Ross. Aust.
prov. Brem. Bor. La G.

Smell caryophyllaceous, lost by drying; taste styptic, bitter; effects tonic, astringent, febrifuge; said to be an excellent substitute for Peruvian bark.

GLECOMA HEDERACEA. *Hedera terrestris.* *Herba.*
Aust. prov. Brem. Bor. Van M. La G.

Taste bitterish, sub-acrid; effects expectorant, roborant.

GLYCYRRHIZA ECHINATA. *Liquiritia, radix.* Bor.
A Russian substitute for the *G. glabra*.

GUILANDINA MORINGA. *Nuces Beben.* Bor.
Oily.

HEDERA HELIX. *Gummi-resina.* La G.
Agglutinant.

HIRUDO MEDICINALIS. *Hirudo. Animal vivum.* Aust.
cast. Gen. Bor. Mar.
Topical abstraction of blood.

HUMULUS LUPULUS. *Lupuli strobuli.* Bor. La G.
Agreeably bitter ; anodyne, diuretic, resolvent.

HYPERICUM QUADRANGULARE. *Hypericum. Flores.*
Brem.
Smell agreeable ; taste bitterish, sub-astringent ; balsamic ; effects vulnerary.

ILEX AQUIFOLIUM. *Aquifolii folia.* Ross. Bor.
No smell ; taste astringent ; effects febrifuge, antiarthritic.

ILLICIUM ANISATUM. *Anisum stellatum. Fructus.* Aust.
prov. Brem. Ross. Bor. Van M. La G.
Smell aromatic, taste agreeable, like anise ; effects pectoral, carminative, diuretic.

IMPERATORIA OSTRUTHIUM. *Imperatoriae radix.*
Ross. Aust. prov.
Smell aromatic ; taste warm, pungent, very durable ; effects stimulant, carminative, sudorific, diuretic.

JASMINUM OFFICINALE. *Jasmini flores.* Ross. Brem.
Smell fragrant ; taste bitterish ; used as a perfume.

LACTUCA SATIVA. *Folia.* La G.
Refreshing ; anodyne.

LAMIUM ALBUM. *Flores.* Van M. La G.
Astringent ; tonic.

LAURUS PECHURIM. *Faba.* Van M.
Bitter, aromatic ; stimulant stomachic.

LEDUM PALUSTRE. *Rorismarini sylvestris herba.* Ross.
Aust. prov. Bor.
Smell heavy, sub-aromatic ; taste bitterish, sub-astringent ; effects resolvent, diuretic.

LEPIDUM SATIVUM. *Folia, semina.* La G.
Antiscorbutic, aperitive, diuretic.

LICHEN ISLANDICUS. Aust. prov. et cast. Brem. Ross.
Gen. Bor. Mar. La G. Van M.
No smell; taste bitterish, subastringent; effect nutritious.

LICHEN PULMONARIUS. La G.
Taste saline, bitter; pectoral.

LIGUSTICUM LEVISTICUM. *Levistici herba, radix, semen.* Ross. Aust. prov. Brem. Bor.
Smell unpleasant; taste warm, aromatic; effects stimulant, carminative, sudorific.

LIQUIDAMBAR STYRACIFLUUM. *Styrax liquida.*
Balsamum. Aust. prov. Bor. Van M. La G.
Smell fragrant; taste acrid, aromatic; effects stimulating, heating.

LONICERA DIERVILLA. *Diervilla stipites.* Ross.
Taste and smell nauseous; effects antivenereal.

LOPEZIANA. *Radix.* Van M.

LORANTHUS EUROPÆUS. *Viscum quercinum, lignum.*
Aust. prov.
Smell nauseous; taste astringent, mucilaginous; effects tonic.

LUPINUS ALBUS. *Farina.* Gen.
Farinaceous; bitter.

LYCOPERDON BOVISTA. Ross.
No taste or smell; effects mechanical, suppression of hæmorrhagy.

LYCOPODIUM CLAVATUM. *Lycopodii semen.* Ross.
Brem. Bor. La G.
No taste or smell; effects absorbent.

LYTHRUM SALICARIA. *Lythymachia purpurea.* *Herba.*
Brem. *Salicaria.* Aust. prov.
No smell; taste subastringent; effects astringent, tonic.

MALVA ROTUNDIFOLIA. *Folia et flores.* Gen.
Demulcent.

MANGANESIIUM. *Manganesium oxidatum nativum.* Bor.
Magnesia nigra. Ross. *Magnesia vitrariorum.* Aust. prov.

Used for the production of oxygen gas, oxymuriatic acid, and some other chemical preparations.

MARANTA GALANGA. *Galanga radix.* Ross. Aust. prov. Brem. Bor. Van M. La G.

Smell fragrant; taste aromatic, pungent, biting; effects stomachic, heating.

MATRICARIA CHAMOMILLA. V. Mons. *Chamomilla vulgaris, flores, herba.* Ross. Aust. prov. et cast. Brem. Bor. Mar.

Smell strong; taste bitter, warmish; effects stomachic, discutient; substitute for chamomile.

MATRICARIA PARTHENIUM. *Matricaria. Flos, herba.* Aust. prov. Bor. Van M. La G.

Smell nauseous; taste bitter; effects stomachic.

MELISSA CALAMINTHA. *Folia.* La G.
Anti-hysteric.

MELOE PROSCARABÆUS. Aust. prov. *Meloë majalis.* Brem. *Vermis majalis.* Ross. Bor.

No smell; taste acrid; effects stimulating, diuretic, caustic.

MENTHA CRISPA. *Herba.* Ross. Aust. prov. Brem. Gen. Mar. Van M.

Smell fragrant, strong; taste warm, aromatic, slightly bitter; effects resolvent, stomachic, carminative.

MENTHA AQUATICA. *Mentha rubra. Oleum distillatum.* Aust. cast.

Similar to the former.

MERCURIALIS ANNUA. *Herba.* Van M. La G.
Purgative.

MIMOSA SENEGAL. *Arabicum gummi.* Brem.
Supposed to produce the finest gum-arabic.

MYROBALANUS CITRINA. *Cortex fructuum. Terminalia species?* Aust. prov.

Taste astringent; effects astringent.

NARCISSUS PSEUDO-NARCISSUS. *Flores.* Van M.
Fragrant; antispasmodic.

NIGELLA SATIVA. *Nigella. Semen.* Brem. La G.
Smell fragrant; taste acrid, aromatic; effects stimulating,
errhine, sialogogue, anthelmintic.

NYMPHÆA LUTEA. *Radix.* La G.
Demulcent.

OCIMUM BASILICUM. Van M. *Basilici herba.* Bor.
Smell fragrant; expectorant.

ONONIS SPINOSA. *Ononis radix.* Aust. prov. Mar.
No smell; taste sweetish; effects diuretic.

ONOPORDUM ACANTHIUM. *Cardui tomentosi herba
recens.* Ross.
No smell; taste bitterish; effects specific, the cure of cancer-
ous affections.

**ORCHIS MASCULA, MORIO, MILITARIS, MACU-
LATA, PYRAMIDALIS, et LATIFOLIA.** *Salep. Satyrium.*
Radix. Ross. Aust. prov. et cast. Brem. Bor. Van M.
Taste amylaceous; effects nutritious.

ORIGANUM DICTAMNUS. *Dictamnus Creticus. Herba.*
Brem.
Smell slight, aromatic; taste aromatic; effects stimulant.

ORYZA SATIVA. *Oryza semen decorticatum.* Ross. Van M.
Taste farinaceous; effects nutritious, astringent.

PÆONIA OFFICINALIS. *Pæonia radix.* Ross. Brem.
Bor. La G.
Smell unpleasant; taste at first sweetish, then disagreeably bit-
ter; effects antispasmodic.

PECHURIM FABÆ. *Ex Laura quadam.* Ross.
Smell fragrant, durable; taste aromatic; effects stomachic,
astringent.

PELLANDRIUM AQUATICUM. *Semen.* Ross. *Fœni-
culum aquaticum.* Brem. Bor.
Smell heavy; taste aromatic, acrid; effects stimulating, re-
solvent.

PHOENIX DACTYLIFERA. *Fructus.* Van M. La G.
Demulcent.

PHYSALIS ALKEKENGII. *Bacca.* Van M. La G.
Diuretic.

PHYTOLACCA DECANDRA. *Phytolacca herba recens, radix.* Ross.

No smell; taste acrid, corrosive; effects corrosive in cancer.

PIMPINELLA SAXIFRAGA. *Pimpinella alba radix.* Ross.
Aust. prov. Brem. Bor. La G.

Smell fragrant; taste warm, acrid; effects stomachic, diaphoretic, diuretic.

PINUS PINEA. *Pinus sativa. Nuclei.* Aust. prov.
Taste sweet, bland; effects nutritious.

PISTACIA VERA. *Fructus.* La G.
Nourishing; analeptic.

PLANTAGO MEDIA. *Plantago. Herba.* Aust. prov.
Taste subastringent; effects astringent.

PLANTAGO PSYLLIUM et CYNOPS. *Psyllii semen.* Ross.
Bor.

Taste nauseous, mucilaginous, then acrid; effects relaxant.

POLYGALA AMARA. *Herba, radix.* Ross. Brem. Gen.
Bor. Van M.

No smell; taste bitter, acidulous, mucilaginous; effects demulcent, roborant.

POLYGALA VULGARIS. *Polygala. Radix.* Aust. prov.
Mar.

Taste sweetish, bitter; effects tonic, expectorant; substitute for feneka.

POLYPODIUM VULGARE. *Polypodii radix.* Ross. Aust.
prov. Brem. Bor.

Taste at first sweet, then nauseous, bitter, and astringent; effects demulcent, resolvent.

POPULUS BALSAMIFERA. *Tacamahaca. Gummi resina.*
Ross. Van M.

Smell fragrant; taste nauseous, bitterish; effects stimulant, tonic.

POPULUS NIGRA. *Gemma.* Van M.
Emollient; soporiferous.

PRUNUS CERASUS. *Cerasorum rubrorum acidorum fructus.* Ross. Brem. Bor.

Taste acidulous, sweetish; effects refrigerating, antiseptic.

Cerasorum nigrorum aqua. Aust. prov.
Narcotic.

PRUNUS LAURO-CERASUS. *Lauro-cerasi folia.* Ross. Brem. Bor.

Smell fragrant; taste bitter, like that of bitter almonds; effects highly deleterious, narcotic, resolvent, diuretic.

PTERIS AQUILINA. *Filicis fœminæ radix.* Ross.
Smell nauseous; taste viscid, bitterish; effects anthelmintic.

PULMONARIA OFFICINALIS. *Folia.* La G.
Anthiphthysical.

PYRUS MALUS. *Poma acidula.* Bor. Van M.
Acidulous.

RANA ESCULENTA. La G.
Nutritious.

RHAMNUS ZIZYPHUS. *Fructus.* Van M.
Lubricant; expectorant.

RHEUM UNDULATUM. *Rhabarbari Sibirici radix.* Ross.
Smell slight; taste bitter and slightly astringent; effects stomachic, purgative.

RHEUM RHAPONTICUM. *Radix.* La G.
Astringent.

RUBUS ARCTICUS. *Bacca.* Ross. La G.
Smell fragrant; taste acidulous, vinous; effects refrigerant, antiscorbutic. Similar properties are possessed by the fruits of the *rubus idæus, cæsius, fruticosus, chamæmorus.*

RUMEX AQUATICUS. *Lapathi aquatici radix.* Ross.
Taste austere, bitter; effects tonic, antiscorbutic.

RUMEX ACUTUS. *Lapathum acutum.* *Radix.* Aust. prov. Brem. Bor. Mar. Van M. La G.
Taste bitterish, acidulous; effects astringent.

SAGUS FARINARIA. *Medulla.* Van M.
Nutritious.

SALIX ALBA, PENTANDRA, FRAGILIS, VITELLINA.
Salicis cortex. Ross. Bor. Mar.

Smell fragrant; taste astringent, bitter; effects tonic, febrifuge.

SALIVA HORMINUM. *Folia.* La G.

Astringent, tonic.

SAMBUCUS EBULUS. *Ebulus. Radix.* Aust. prov.

Smell fetid; taste nauseous, bitter, acrid; effects drastic, cathartic, emetic, narcotic.

SANICULA EUROPÆA. *Folia.* La G.

Harsh, herbaceous taste.

SAPONARIA OFFICINALIS. *Saponariæ radix.* Ross.

Aust. prov. *et cast.* Brem. Bor. Mar. Van M. La G.

No smell; taste slightly sweet, bitter, and glutinous; effects detergent.

SCABIOSA SUCCISA. *Radix.* La G.

Alexipharmic.

SCABIOSA ARVENSIS. *Scabiosa. Folium.* Aust. prov.

Van M.

Taste slightly bitter; effects expectorant, vulnerary.

SCANDIX CEREFOLIUM. *Cerefolii herba. Succus.* Brem.

Aust. prov.

Smell weak, balsamic; taste aromatic, balsamic; effects aperient, pectoral, diuretic.

SCORZONERA HISPANICA. *Scorzonera. Radix.* Aust.

prov. Bor.

Taste sweetish; effects aperient, demulcent.

SCROPHULARIA NODOSA. *Scrophularia. Folium. Ra-*

dix. Aust. prov.

Smell unpleasant; taste nauseous, bitter; effects attenuant.

SECALE CEREALE. *Secalis farina.* Aust. prov. Gen.

Van M.

Taste farinaceous; effects nutritious.

SEMPERVIVUM TECTORUM. *Sedi majoris folia virentia.*

Ross. Aust. prov. Brem.

Smell weak; taste sub-acrid, slightly styptic; effects refrigerant, astringent.

SENECIO JACOBÆA. *Herba.* Van M.
Anthelmintic.

SEPIA OCTOPODA. *Sepiæ os.* Brem.
A carbonate of lime agglutinated by animal gluten.

SIUM SISARUM. *Ginseng. Radix.*
Bitter sweet, tonic.

SMILAX CHINA. *China radix.* Aust. prov. Brem.
No smell; taste mucilaginous; effects sudorific, antivenereal.

SOLANUM NIGRUM. *Herba.* Bor. Van M. Mar.
Smell nauseous; effects diuretic, narcotic.

SPIGELIA ANTHELMIA. *Herba cum radice.* Ross. Brem.
Taste and smell fetid; effects narcotic, purgative, anthelmintic.

STRYCHNOS NUX VOMICA. *Nux vomica.* Bor. Van M. La G.
No smell; taste intensely bitter; effects tonic, narcotic, deleterious.

SYMPHITUM OFFICINALE. Van M. La G. *Symphiti-
radix.* Ross. *Consolida major.* Aust. prov. Brem.
No smell; taste mucilaginous; effects emollient, inspissant.

TESTUDO FEROX, &c. La G.
Nutritious.

TEUCRIUM CHAMÆDRYS. *Chamædryos herba.* Ross.
Aust. prov. Brem. La G.
Smell slightly fragrant; taste bitter; effects tonic, emmenagogue.

TEUCRIUM CHAMÆPITYS. *Chamæpityos herba.* Ross.
Smell fragrant; taste bitter and aromatic; effects tonic.

THEOBROMA CACAO. Van M. La G. *Cacao. Nucleus.
Oleum.* Ross. Aust. prov. Brem. Bor.
Little smell; taste pleasant and oily, very slightly astringent and bitterish; effects nutritious. Oil bland, sweetish; effects emollient, lubricating.

THYMUS SERPYLLUM. *Serpylli herba.* Ross. Aust. prov. Brem. Bor. La G.

Smell fragrant; taste aromatic, bitterish; effects stimulant, diuretic, emmenagogue.

THYMUS VULGARIS. *Thymi herba.* Ross. Brem. La G.

Smell fragrant; taste warm, pungent, bitter; effects stimulant, diuretic, emmenagogue.

TILIA EUROPÆA. *Flores.* Van M. La G.

Fragrant; anodyne.

TRIFOLIUM MELILOTUS OFFICINALIS. *Meliloti herba cum floribus.* Ross. Aust. prov. Brem. Bor. Van M.

Smell fragrant; taste herbaceous, bitterish; effects discutient.

TRITICUM REPENS. Van M. La G. *Graminis radix.* Ross. Aust. prov. et cast. Brem. Gen. Bor.

Smell herbaceous; taste sweetish; effects aperient, demulcent.

VACCINIUM MYRTILLUS. *Myrtilli bacca.* Ross. Aust. prov.

No smell; taste acidulous, sub-astringent; effects refrigerant, astringent.

VACCINIUM OXYCOCCOS. *Oxycocci bacca.* Ross.

Taste acidulous; effects refrigerant.

VACCINIUM VITIS IDÆA. *Vitis idæa bacca, folia.* Ross.

Taste acidulous; effects refrigerant, antiseptic.

VERATRUM SABADILLA. Van. M. *Sabadilla semen.* Ross. Aust. prov. et cast. Brem. Bor. Mar. La G.

Taste very bitter, acrid, and caustic; effects stimulant, drastic, cathartic, anthelmintic, errhine.

VERBASCUM THAPSUS. Van. M. La G. *Verbasci flores, folia.* Ross. Aust. prov. Brem. Bor. Mar.

Taste of the leaves herbaceous, bitterish; effects emollient, discutient; smell of the flowers sweet; taste sweet; effects pectoral.

VERBENA OFFICINALIS. *Folia.* La G.

Vulnerary.

VERONICA OFFICINALIS. *Folia.* Van. M. La G.

Vulnerary; pectoral.

VICIA FABA. *Faba. Semen.* Aust. prov.
Taste farinaceous ; effects nutritious.

VIOLA TRICOLOR. *Herba.* Ross. Aust. prov. *Jacea.*
Herba. Brem. Bor. Mar. Van M.
Smell agreeable ; taste mucilaginous, bitterish ; effects anodyne.

VISCUM ALBUM. Bor. La G.
Glutinous ; specific ; anti-paralytic ; anti-epileptic.

VITIS VINIFERA APYRENA. *Passula minores.* Ross.
Brem.
Taste sweet, acidulous ; effects refrigerant, demulcent, lubricating.

No. II.

List of Animals which furnish Articles of the Materia Medica, arranged according to Cuvier's System.

MAMMALIA.

RODENTIA. Castor fiber.
PACHYDERMATA. Sus scrofa.
RUMINANTIA. Moschus moschiferus. Cervus elaphus. Ovis aries. Bos taurus.
CETACEA. Phseter macrocephalus.

AVES.

GALLINE. Phasianus gallus.
ANSERES. Anas anser.

PISCES.

CHONDROPTERYGII. Acipenser sturio, stellatus, huso, ruthenus.

CRUSTACEA.

CANCERES. Cancer pagurus, astacus.

INSECTA.

COLEOPTERA. *Lytta vesicatoria.* (*Meloe vesicatorius.*) *Meloe proscarabæus.*

HYMENOPTERA. *Cyneps querci folii.* *Apis mellifera.* *Formica rufa.*

HEMIPTERA. *Coccus cacti.*

GNATHAPTERA. *Oniscus asellus.*

MOLLUSCA.

CEPHALOPODA. *Sepia officinalis.*

ACEPHALA. *Ostrea edulis.*

VERMES.

Hirudo medicinalis.

ZOOPHYTA.

CERATOPHYTA. *Gorgonia nobilis.* (*Isis nobilis.*)

SPONGIA. *Spongio officinalis.*

No. III.

List of the Genera of Medicinal Plants, arranged according to the Linnean System.

Cl. I. MONANDRIA.

Ord. MONOGYNIA.

Kæmpferia.

Curcuma.

Amomum.

Costus.

Maranta.

Lopezia.

Cl. II. DIANDRIA.

Ord. MONOGYNIA.

Olea.

Veronica.

Gratiola.

Verbena.

Rosmarinus.

Salvia.

Cl. II. DIANDRIA.

Ord. TRIGYNIA.

Piper.

Cl. III. TRIANDRIA.

Ord. MONOGYNIA.

Valeriana.

Crocus.

Iris.

Ord. DIGYNIA.

Saccharum.

Avena.

Secale.

Triticum.

Hordeum.

Cl. IV. TETRANDRIA.

Ord. MONOGYNIA.

Scabiosa.

Plantago.

Penæa.

Rubia.

Fagara.

Santalum.

Alchemilla.

Dorstenia.

Ord. DIGYNIA.

Cuscuta.

Cl. V. PENTANDRIA.

Ord. MONOGYNIA.

Pulmonaria.

Symphitum.

Borago.

Cynoglossum.

Anagallis.

Anchusa.

Spigelia.

Menyanthes.

Convolvulus.

Datura.

Hyosciamus.

Nicotiana.

Verbascum.

Chironia.

Cl. V. PENTANDRIA.

Ord. MONOGYNIA.

Cordia.

Strychnos.

Capsicum.

Solanum.

Physalis.

Atropa.

Cinchona.

Lobelia.

Psychotria.

Cephaëlis.

Lonicera.

Rhamnus.

Vitis.

Viola.

Ribes.

Hedera.

Ord. DIGYNIA.

Gentiana.

Chenopodium.

Ulmus.

Eryngium.

Sanicula.

Daucus.

Conium.

Sium.

Cuminum.

Ferula.

Bubon.

Angelica.

Coriandrum.

Phellandrium.

Imperatoria.

Cicuta.

Carum.

Pastinaca.

Anethum.

Apium.

Pimpinella.

Ord. TRIGYNIA.

Sambucus.

Rhus.

Ord. PENTAGYNIA.

Linum.

Cl. VI. HEXANDRIA.

Ord. MONOGYNIA.

Loranthus.

Berberis.

Narcissus.

Allium.

Aloë.

Convallaria.

Dracæna.

Scilla.

Asparagus.

Lilium.

Acorus.

Calamus.

Ord. DIGYNIA.

Oryza.

Ord. TRIGYNIA.

Colchicum.

Rumex.

Cl. VII. HEPTANDRIA.

Ord. MONOGYNIA.

Æsculus.

Cl. VIII. OCTANDRIA.

Ord. MONOGYNIA.

Amyris.

Vaccinium.

Daphne.

Ord. TRIGYNIA.

Coccoloba.

Polygonum.

Cl. IX. ENNEANDRIA.

Ord. MONOGYNIA.

Laurus.

Ord. TRIGYNIA.

Rheum.

Cl. X. DECANDRIA.

Ord. MONOGYNIA.

Myroxylon.

Toluifera.

Cassia.

Guilandina.

Cl. X. DECANDRIA.

Ord. MONOGYNIA.

Dictamnus.

Hæmatoxylon.

Swietenia.

Guajacum.

Ruta.

Quassia.

Ledum.

Rhododendron.

Arbutus.

Styrax.

Copaifera.

Ord. DIGYNIA.

Saponaria.

Dianthus.

Ord. PENTAGYNIA.

Oxalis.

Ord. DECAGYNIA.

Phytolacca.

Cl. XI. DODECANDRIA.

Ord. MONOGYNIA.

Afarum.

Garcinia.

Canella.

Portulaca.

Lythrum.

Ord. DIGYNIA.

Agrimonia.

Ord. TRIGYNIA.

Euphorbia.

Cl. XII. ICOSANDRIA.

Ord. MONOGYNIA.

Cactus.

Eugenia.

Myrtus.

Punica.

Eucalyptus.

Amygdalus.

Prunus.

Ord. PENTAGYNIA.

Pyrus.

Cl. XII. ICOSANDRIA.

Ord. POLYGYNIA.

Rosa.
 Rubus.
 Tormentilla.
 Fragaria.
 Potentilla.
 Geum.

Cl. XIII. POLYANDRIA.

Ord. MONOGYNIA.

Papaver.
 Chelidonium.
 Cistus.
 Tilea.
 Nymphæa.

Ord. DIGYNIA.

Pæonia.

Ord. TRIGYNIA.

Delphinium.
 Aconitum.

Ord. TETRAGYNIA.

Wintera.

Ord. PENTAGYNIA.

Nigella.

Ord. POLYGYNIA.

Clematis.
 Helleborus.

Cl. XIV. DIDYNAMIA.

Ord. GYMNOSPERMIA.

Glecoma.
 Hyssopus.
 Mentha.
 Lavandula.
 Teucrium.
 Lamium.
 Satureja.
 Marrubium.
 Thymus.
 Ocimum.
 Origanum.
 Melissa.

Ord. ANGIOSPERMIA.

Euphrasia.
 Scrophularia.

Cl. XV. TETRADYNAMIA.

Ord. SILICULOSÆ.

Cochlearia.
 Lepidium.
 Raphanus.
 Cardamine.
 Sinapis.
 Sifymbrium.

Cl. XVI. MONADELPHIA.

Ord. TRIANDRIA.

Tamarindus.

Ord. POLYANDRIA.

Malva.
 Althæa.

Cl. XVII. DIADELPHIA.

Ord. HEXANDRIA.

Fumaria.

Ord. OCTANDRIA.

Polygala.

Ord. DECANDRIA.

Pterocarpus.
 Spartium.
 Genista.
 Lupinus.
 Dolichos.
 Astragalus.
 Trifolium.
 Glycyrrhiza.
 Geoffroya.
 Trigonella.

Cl. XVIII. POLYADELPHIA.

Ord. DECANDRIA.

Theobroma.

Ord. ICOSANDRIA.

Citrus.

Ord. POLYANDRIA.

Melaleuca.
 Hypericum.

Cl. XIX. SYNGENESIA.

Ord. POLYGAMIA *ÆQUALIS*.

Cichoreum.
 Scorzonera.

Cl. XIX. SYNGENESIA.

Ord. POLYGAMIA ÆQUALIS.

Leontodon.

Lactuca.

Carlina.

Arctium.

Carthamus.

Cynara.

Carduus.

Ord. POLYGAMIA SUPER-
FLUA.

Artemisia.

Tanacetum.

Bellis.

Matricaria.

Arnica.

Inula.

Solidago.

Senecio.

Tussilago.

Anthemis.

Achillea.

Ord. POLYGAMIA FRUSTRA-
NEA.

Centaurea.

Ord. POLYGAMIA NECESSA-
RIA.

Calendula.

Cl. XX. GYNANDRIA.

Ord. DIANDRIA.

Orchis.

Epidendrum.

Ord. HEXANDRIA.

Aristolochia.

Ord. DODECANDRIA.

Cytinus.

Ord. POLYANDRIA.

Arum.

Cl. XXI. MONOECIA.

Ord. TETRANDRIA.

Betula.

Morus.

Urtica.

Ord. POLYANDRIA.

Quercus.

Cl. XXI. MONOECIA.

Ord. POLYANDRIA.

Juglans.

Liquidamber.

Ord. MONADELPHIA.

Pinus.

Ricinus.

Croton.

Ord. SYNGENESIA.

Momordica.

Cucumis.

Cucurbita.

Bryonia.

Cl. XXII. DIOECIA.

Ord. DIANDRIA.

Salix.

Ord. TETRANDRIA.

Viscum.

Ord. PENTANDRIA.

Pistacia.

Cannabis.

Humulus.

Ord. HEXANDRIA.

Smilax.

Ord. OCTANDRIA.

Populus.

Ord. MONADELPHIA.

Juniperus.

Cissampelos.

Cl. XXIII. POLYGAMIA.

Ord. MONOECIA.

Veratum.

Mimosa.

Parietaria.

Ord. DIOECIA.

Fraxinus.

Panax.

Ord. TRIOECIA.

Ficus.

Ceratonia.

Cl. XXIV. CRYPTOGRAMIA.

Ord. FILICES.

Polypodium.

Adiantum.

Cl. XXIV. CRYPTOGRAMIA. Cl. XXIV. CRYPTOGRAMIA.

Ord. MUSCI.

Lycopodium.

Ord. ALGÆ.

Lichen.

Conferva.

Ord. FUNGI.

Agaricus.

Ord. FUNGI.

Boletus.

Lycoperdon.

Cl. XXV. PALMÆ.

Cocos.

Phoenix.

Sagus.

*List of Official Genera, arranged according to the Natural System of
Jussieu, improved by Ventenat.*

Cl. I. ACOTYLEDONES.

Ord. 1. FUNGI.

Lycoperdon.

Boletus

Agaricus.

2. ALGÆ.

Conferva.

Lichen.

Plataphyllum.

Ord. 3. HEPATICÆ.

4. MUSCI.

Lycopodium.

5. FILICES.

Polypodium.

Pteris.

Adiantum.

Cycas.

MONOCOTYLEDONES.

Cl II. *Stamina hypogynia.*

Ord. 1. PLUVIALES.

2. AROIDEÆ.

Arum.

Acorus.

3. TYPHOIDEÆ.

4. CYPEROIDEÆ.

5. GRAMINEÆ.

Saccharum.

Lolium.

Hordeum.

Triticum.

Secale.

Avena.

Oryza.

Cl. III. *Perigynia.*

Ord. 1. PALMÆ.

Calamus.

Areca.

Cocos.

Sagus.

Phoenix.

2. ASPARAGOIDEÆ.

Dracæna.

Asparagus.

Convallaria.

3. SMILACEÆ.

Smilax.

4. IONCACEÆ.

Veratrum.

Colchicum.

MONOCOTYLEDONES.

Cl. III. *Perigynia*.

Ord. 5. ALISMOIDEÆ.

6. LILIACEÆ.

a. Asphodeloideæ.

Scilla.

Allium.

b. Gloriosæ.

Lilium.

c. Aloideæ.

Aloë.

7. NARCISSOIDEÆ.

Narcissus.

Cl. III. *Perigynia*.

Ord. 8. IRIDEÆ.

Iris.

Crocus.

Cl. IV. *Epigynia*.

Ord. 1. SCITAMINEÆ.

2. DRYMYRRHIZÆ.

Amomum.

Kämpferia.

3. ORCHIDEÆ.

Orchis.

Vanilla.

4. HYDROCHARIDEÆ.

DICOTYLEDONES.

A. *Flores apetalæ*.Cl. V. *Epigynia*.

ORD. 1. ASAROIDEÆ.

Aristolochia.

Afarum.

Cytinus.

Cl. VI. *Perigynia*.

Ord. 5. POLYGONEÆ.

Rumex.

Rheum.

6. CHENOPODEÆ.

Phytolacca.

Chenopodium.

Cl. VI. *Perigynia*.

1. ELÆAGNOIDEÆ.

2. DAPHNOIDEÆ.

Daphne.

3. PROTEOIDEÆ.

4. LAURINEÆ.

Laurus.

Myristica.

5. POLYGONEÆ.

Coccoloba.

Polygonum.

Cl. VII. *Hypogynia*.

Ord. 1. AMARANTHOIDEÆ.

2. PLANTAGINEÆ.

Plantago.

Pfyllum.

3. NYCTAGINEÆ.

Mirabilis.

4. PLUMBAGINEÆ.

B. *Monopetalæ*.Cl. VIII. *Hypogynia*.

Ord. 1. PRIMULACEÆ.

2. OROBANCHOIDEÆ.

3. RHINANTHOIDEÆ.

Polygala.

Veronica.

Cl. VIII. *Hypogynia*.

Ord. 4. ACANTHOIDEÆ.

5. LILAGEÆ.

Fraxinus.

6. IASMINEÆ.

Olea.

DICOTYLEDONES.

B. *Monopetali.*Cl. VIII. *Hypogynia.*

Ord. 7. PYRENACEÆ.

8. LABIATÆ.

Rosmarinus.

Salvia.

Teucrium.

Hyssopus.

Lavandula.

Mentha.

Glecoma.

Marrubium.

Origanum.

Thymus.

Melissa.

Ocimum.

9. PERSONATÆ.

Digitalis.

Gratiola.

10. SOLANÆÆ.

Hyosciamus.

Nicotiana.

Datura.

Atropa.

Solanum.

Capsicum.

11. SEBESTENÆÆ.

Cordia.

12. BORRAGINÆÆ.

Anchusa.

13. CONVULVULACEÆÆ.

Convolvulus.

14. POLEMONACEÆÆ.

15. BIGNONEÆÆ.

16. GENTIANÆÆÆ.

Menyanthes.

Gentiana.

Chironea.

Spigelia.

Cl. VIII. *Hypogynia.*

Ord. 17. APOCINÆÆ.

Asclepias.

18. HILOSFERMÆÆ.

Cl. IX. *Perigynia.*

1. EBENACEÆÆ.

Styrax.

2. RHODORACEÆÆ.

Rhododendron.

Ledum.

Cl. IX. *Perigynia.*

3. BICORNES,

Arbutus.

Vaccinium.

4. CAMPANULACEÆÆ.

Lobelia.

Cl. X. *Epigynia*, with united
antheræ.

1. CICHORACEÆÆ.

Lactuca.

Taraxacum.

Cichorium.

Scolymus.

2. CINAROCEPHALÆÆ.

Cinara.

Arctium.

Centaurea.

3. CORYMBIFERÆÆ.

Anthemis.

Achillea.

Solidago.

Inula.

Tussilago.

Arnica.

Matricaria.

Tanacetum.

DICOTYLEDONES.

B. *Monopetali.*Cl. X. *Epigynia*, with united antheræ.

Ord. 3. CORYMBIFERÆ.

Artemisia.

Absinthium.

XI. *Epigynia*, with distinct antheræ.

Ord. 1. DISPASCEÆ.

Valeriana.

2. RUBIACEÆ.

Galium.

Cl. XI. *Epigynia*, with distinct antheræ.

Ord. 2. RUBIACEÆ.

Rubia.

Cinchona.

Psychotria.

Coffea.

3. CAPRIFOLIACEÆ.

Diervilla.

Sambucus.

Cornus.

Hedera.

DICOTYLEDONES.

C. *Polypetali.*Cl. XII. *Epigynia*.

Ord. 1. ARALIACEÆ.

Panax.

2. UMBELLIFERÆ.

Pimpinella.

Carum.

Apium.

Anethum.

Pastinaca.

Imperatoria.

Scandix.

Coriandrum.

Phellandrium.

Cuminum.

Bubon.

Sium.

Angelica.

Sigusticum.

Ferula.

Cicuta.

Daucus.

Eryngium.

Cl. XIII. *Hypogynia*.

Ord. 1. RANUNCULACEÆ.

Aconitum.

2. TULIPIFERÆ.

Illicium.

3. GLYPTOSPERMÆ.

4. MENISPERMOIDÆ.

5. BERBERIDÆ.

Berberis.

6. PAPAVERACEÆ.

Papaver.

Chelidonium.

Fumaria.

7. CRUCIFERÆ.

Raphanus.

Sinapis.

Sisymbrium.

Cardamine.

Cochlearia.

Nasturtium.

8. CAPPARIDÆ.

9. SAPONACEÆ.

10. MALPIGHIACEÆ.

Hippocastanum.

11. HYPERICOIDÆ.

Hypericum.

12. GOTTIFERÆ.

Mangostana.

Cl. XIII. *Hypogynia*.

Ord. 1. RAUNCULACEÆ.

Clematis.

Helleborus.

Delphinium.

DICOTYLEDONES.

C. *Polypetali.*Cl. XIII. *Hypogynia.*Ord. 13. *HESPERIDÆ.*

Citrus.

14. *MELIACÆ.*

Canella.

Swietenia.

15. *SARMENTACÆ.*

Vitis.

16. *GERANIOIDÆ.*

Oxalis.

17. *MALVACÆ.*

Malva.

Althœa.

Hibiscus.

Theobroma.

18. *TILIACÆ.*

Tilia.

19. *CISTOIDÆ.*

Cistus.

Viola.

Cl. XIII. *Hypogynia.*Ord. 20. *RUTACÆ.*

Guaiacum.

Ruta.

Dictamnus.

21. *CARYOPHYLLÆ.*

Dianthus.

Linum.

Cl. XIV. *Perigynia.*1. *PORTULACÆ.*2. *FICOIDÆ.*3. *SUCCULENTÆ.*

Sedum.

4. *SAXIFRAGÆ.*

Ribes.

5. *CACTOIDÆ.*

Cactus.

PART III.

PREPARATIONS AND COMPOSITIONS

CHAP. I.

S U L P H U R.

SULPHUR SUBLIMATUM LOTUM. *Edin.*

FLORES SULPHURIS LOTI. *Lond.*

Washed Sublimed Sulphur. Washed Flowers of Sulphur.

Take

Sublimed sulphur, one pound;

Water, four pounds.

Boil the sulphur for a little in the water, then pour off this water, and wash away all the acid by affusions of cold water; and lastly, dry the sulphur.

SULPHUR SUBLIMATUM LOTUM. *Dub.*

Washed Sublimed Sulphur.

Let warm water be poured upon sublimed sulphur, and the washing be repeated as long as the water, when poured off, is impregnated with acid.

When dried, it is to be kept in well-closed vessels.

As it is impossible to sublime sulphur in vessels perfectly void of air, a small portion of it is always acidified and converted into sulphurous or sulphuric acid. The presence of acid in sulphur, is always to be considered as an impurity, and must be removed by careful ablution. When thoroughly washed, sublimed sulphur is not acted upon by the atmosphere; there is therefore no particular reason for preserving it from the action of the air; for if, on keeping, it become moist, it is because the sulphuric acid has not been entirely washed away.

Off. prep.—Trochisci. *Lond.*

SULPHUR PRÆCIPITATUM. *Lond.*
Precipitated Sulphur.

Take of

- Sulphurated kali, six ounces ;
- Distilled water, one pound and an half ;
- Diluted vitriolic acid, as much as is sufficient.

Boil the sulphuretted kali in the distilled water until it be dissolved. Filter the liquor through paper, to which add the diluted vitriolic acid. Wash the precipitated powder by repeated affusions of water till it become insipid.

Dub.

Take of

- Sulphuretted vegetable alkali, four ounces ;
- Boiling water, a pound and a half ;
- Diluted nitrous acid, as much as may be sufficient.

Dissolve the sulphuretted vegetable alkali in the water, and add the acid to the filtered liquor as long as the liquor is rendered turbid by its addition. Wash the precipitated powder well with warm water, and keep it after it is dried in well-closed vessels.

Instead of dissolving sulphuret of potass in water, we may gradually add sublimed sulphur to a boiling solution of potass, until it be saturated.

When the sulphuretted potass is thrown into water, it is entirely dissolved, but not without decomposition, for it is converted into sulphate of potass, hydroguretted sulphuret of potass, and sulphuretted hydroguret of potass. The two last compounds are again decomposed on the addition of any acid. The acid combines with the potass, sulphuretted hydrogen flies off in the form of gas, while sulphur is precipitated. It is of little consequence what acid is employed to precipitate the sulphur. The London college order the sulphuric ; while the Dublin college use nitrous acid, probably because the nitrate of potass formed, is more easily washed away than sulphate of potass.

Precipitated sulphur does not differ from well-washed sublimed sulphur, except in being much dearer. Its paler colour is owing to its more minute division, or according to Dr. Thomson, to the presence of a little water ; but from either circumstance it derives no superiority to compensate for the disagreeableness of its preparation.

CHAP. II.

A C I D S.

ACIDUM SULPHURICUM DILUTUM. *Edin.**Diluted Sulphuric Acid.*

Take of
 Sulphuric acid, one part;
 Water, seven parts.
 Mix them.

ACIDUM VITRIOLICUM DILUTUM. *Lond.**Diluted or weak Vitriolic Acid.*

Take of
 Vitriolic acid, one ounce;
 Distilled water, eight ounces.
 Mix them by degrees.

Dub.

Take of
 Vitriolic acid, two ounces;
 Distilled water, fourteen ounces.
 Having gradually mixed them, set them aside to cool, and then pour off the clear liquor.

THE most simple form in which sulphuric acid can be advantageously employed internally, is that in which it is merely diluted with water: and it is highly proper that there should be some fixed standard in which the acid in this state should be kept. It is, however, much to be regretted, that the colleges have not adopted the same standard with respect to strength: for in the Edinburgh and Dublin colleges, the strong acid constitutes an eighth; and in the London, only a ninth of the mixture. The former proportion seems preferable, as it gives exactly a drachm of acid to the ounce; but the dilution by means of distilled water is preferable to spring water; which, even in its purest state, is not free from impregnations affecting the acid. Even when distilled water is used, there is often a small quantity of a white precipitate, arising from lead dissolved in the acid.

Sulphuric acid has a very strong attraction for water; and their bulk when combined is less than that of the water and acid separately. At the same time, there is a very considerable increase of temperature produced, which is apt to crack glass vessels, unless the combination be very cautiously made; and for the same reason, the acid must be poured into the water, not the water into the acid.

Off. Prep.—Acid. Benzoic. *Ed.* Aqua aeris fixi. *Dub.*

ACIDUM NITROSUM. *Edin.**Nitrous Acid.*

Take of

Very pure nitrate of potass, two pounds ;

Sulphuric acid, sixteen ounces.

Having put the nitrate of potass into a glass retort, pour upon it the sulphuric acid, and distil in a sand bath, with a heat gradually increased, until the iron pot begins to be red-hot.

The specific gravity of this acid is to that of distilled water as 1550 to 1000.

Lond.

Take of

Purified nitre, by weight, sixty ounces ;

Vitriolic acid, by weight, twenty-nine ounces.

Mix and distil.

The specific gravity of this is to the weight of distilled water as 1550 to 1000.

Dub.

Take of

Nitre, six pounds ;

Vitriolic acid, three pounds.

Mix and distil, until the residuum becomes dry

The specific gravity of the acid is to the weight of distilled water as 1550 to 1000.

IN this process, the sulphuric acid, by its superior affinity, combines with the potass of the nitre to form sulphate of potass, while the nitric acid is separated, and is not only converted into vapour by the application of the heat to the retort, but is also partially decomposed. A portion of oxygen escapes in a gaseous form, and the nitric oxide gas combines with the nitric acid ; so that the liquor condensed in the receiver is nitrous and not nitric acid.

In performing this process, we must take care, in pouring in the sulphuric acid, not to soil the neck of the retort. Instead of a common receiver, it is of advantage to use some modification of Woulfe's apparatus, and as the vapours are extremely corrosive, the fat lute must be used to connect the retort with it. The difference of the proportions of the ingredients directed by the different colleges, has no effect on the quality of the acid obtained, but only affects the residuum. The London and Dublin colleges use no more sulphuric acid than what is necessary to expel all the nitric acid, and the residuum is a neutral sulphate of potass, so insoluble, that it cannot be got out without breaking the retort. The Edinburgh college order as much sulphuric acid as renders the residuum, an acidulous sulphate of potass, easily soluble in water.

Nitrous acid is frequently impure. Sulphuric acid is easily got rid of by re-distilling the nitrous acid from a small quantity of mi-

trate of potash. But its presence is not indicated when nitrous acid forms a precipitate with nitrate of baryta, as affirmed by almost all chemical authors; for nitrate of baryta was discovered by Mr. Hume to be insoluble in nitrous acid.

Muriatic acid is detected by the precipitate formed with nitrate of silver, and may be separated by dropping into the nitrous acid a solution of nitrate of silver, as long as it forms any precipitate, and drawing off the nitrous acid by distillation.

The general properties of nitrous acid have been already noticed. Mr. Davy has shewn that it is a compound of nitric acid and nitric oxide, and that by additional doses of the last constituent, its colour is successively changed, from yellow to orange, olive green, and blue green, and its specific gravity is diminished. The specific gravity is probably stated too high by the colleges; for although Rouelle makes that of the strongest nitric acid 1.583, yet Kirwan could produce it no stronger at 60° than 1.5543, and Mr. Davy makes it only 1.504, and when saturated with nitric oxide only 1.475.

Off. Prep.—Spiritus æth. nitros. *Ed. Lond. Dub.*

ACIDUM NITROSUM DILUTUM. *Lond. Dub. Ed.*

Diluted Nitrous Acid.

Take of

Nitrous acid,

Water, equal weights,

Mix them, taking care to avoid the noxious vapours,

NITROUS ACID has a great affinity for water, and attracts it from the atmosphere. During their combination there is an increase of temperature, part of the nitric oxide is dissipated in the form of noxious vapours, and the colour changes successively from orange to green, and to blue, according as the proportion of water is increased. A mixture of equal parts of Kirwan's standard acid of 1.5543 and water, has the specific gravity 1.1911.

Off. Prep.—Sulph. præc. *Dub.* Nitras argenti, *Ed. Lond. Dub.* Acetis hyd. *Ed. Lond. Dub.* Sub-murias hydrarg. præcip. *Ed. Lond. Dub.* Oxid. hyd. cin. *Ed. Dub.* Oxidum hyd. rubr. per acid. nitric. *Ed. Lond. Dub.*

ACIDUM NITRICUM. *Ed.*

Nitric acid.

Take of

Nitrous acid, any quantity.

Pour it into a retort, and having adapted a receiver, apply a very gentle heat, until the reddest portion shall have passed over, and the acid which remains in the retort shall have become nitric acid,

WE have already stated, that nitrous acid is nitric acid combined with a variable proportion of nitric oxide. Now, by the application of a gentle heat, the whole of the nitric oxide is vaporized, and pure colourless nitric acid remains in the retort. The nitric oxide, however, carries over with it a portion of the acid, and condenses with it in the receiver, in the form of a very high-coloured nitrous acid.

Richter has given the following manner of preparing nitric acid.

Take of

Purified nitrate of potash, seven pounds;

Black oxide of manganese, one pound two ounces;

Sulphuric acid, four pounds, four ounces, and six drachms.

Into a retort capable of containing twenty-four pounds, introduce the nitre and manganese, powdered and mixed, and pour upon them gradually, through a retort-funnel, the sulphuric acid. Lute on the receiver with flour and water, and conduct the distillation with a gradually increased heat.

From these proportions, Richter got three pounds nine ounces of very slightly-coloured nitric acid. The operation will be conducted with less hazard in a Woulfe's apparatus, or by interposing between the retort and a receiver a tubulated adapter, furnished with a bent tube, of which the further extremity is immersed in a vessel containing a small quantity of water.

THESE acids, the nitrous and nitric, have been long employed as powerful pharmaceutic agents. Their application in this way I shall have many opportunities of illustrating.

Medical use.—Lately, however, their use in medicine has been considerably extended. In the state of vapour they have been used to destroy contagion in jails, hospitals, ships, and other places where the accumulation of animal effluvia is not easily avoided. The fumigating such places with the vapour of nitrous acid has certainly been attended with success; but we have heard that success ascribed entirely to the ventilation employed at the same time. Ventilation may unquestionably be carried so far, that the contagious miasmata may be diluted to such a degree that they shall not act on the body; but to us it appears no less certain, that these miasmata cannot come in contact with nitric acid or oxy-muriatic acid vapour, without being entirely decomposed and completely destroyed. Fumigation is, besides, applicable in situations which do not admit of sufficient ventilation; and where it is, the previous diffusion of acid vapours is an excellent check upon the indolence and inattention of servants and nurses, as by the smell we are enabled to judge whether they have been sufficiently attentive to the succeeding ventilation. Nitric acid vapour, also, is not deleterious to life, and may be diffused in the apartments of the sick,

without occasioning to them any material inconvenience. The means of diffusing it are easy. Half an ounce of powdered nitre is put into a saucer, which is placed in a pipkin of heated sand. On the nitre two drachms of sulphuric acid are then poured. The fumes of nitric acid immediately begin to rise. This quantity will fill with vapour a cube of ten feet; and by employing a sufficient number of pipkins, the fumes may be easily made to fill a ward of any extent. After the fumigation, ventilation is to be carefully employed. For introducing this practice, Dr. Camichael Smyth received from the British parliament a reward of five thousand pounds.

The internal use of these acids has also been lately much extended. In febrile diseases, water acidulated with them forms one of the best antiphlogistic and antiseptic drinks we are acquainted with. Hoffmann and Eberhard long ago employed it with very great success in malignant and petechial fevers; and in the low typhus, which frequently rages among the poor in the suburbs of Edinburgh, I have repeatedly given it with unequivocal advantage. In the liver complaint of the East-Indies, and in syphilis, nitric acid has also been extolled as a valuable remedy by Dr. Scott, and the evident benefits resulting from its use in these complaints has given rise to a theory, that mercury only acts by oxygenizing the system. It is certain that both the primary and secondary symptoms of syphilis have been removed by the use of these acids, and that the former symptoms have not returned, or been followed by any secondary symptoms. But in many instances they have failed, and it is doubtful if ever they effected a permanent cure, after the secondary symptoms appeared. Upon the whole, the opinions of Mr. Pearson on this subject, lately agitated with so much keenness, appear to us so candid and judicious, that we shall insert them here. He does not think it eligible to rely on the nitrous acid in the treatment of any one form of the lues venerea; at the same time, he by no means wishes to see it exploded as a medicine altogether useless in that disease. When an impaired state of the constitution renders the introduction of mercury into the system inconvenient, or evidently improper, the nitrous acid will be found, he thinks, capable of restraining the progress of the disease, while, at the same time, it will improve the health and strength of the patient. On some occasions, this acid may be given in conjunction with a mercurial course, and it will be found to support the tone of the stomach, to determine powerfully to the kidneys, and to counteract in no inconsiderable degree the effects of mercury on the mouth and fauces.

ACIDUM MURIATICUM. *Edin.*
Muriatic Acid.

Take of

Muriate of soda, two pounds ;
 Sulphuric acid, sixteen ounces ;
 Water, one pound.

Heat the muriate of soda for some time red-hot in a pot, and after it has cooled, put it into a retort. Then pour upon the muriate of soda the acid mixed with the water and allowed to cool. Lastly, distil in a sand bath, with a moderate fire, as long as any acid is produced.

The specific gravity of this acid is to that of distilled water as 1170 to 1000.

Lond.

Take of

Dried sea-salt, ten pounds ;
 Vitriolic acid, six pounds ;
 Water, five pounds.

Add by degrees the vitriolic acid, first mixed with the water, to the salt ; then distil.

The specific gravity of this acid is to that of distilled water as 1170 to 1000.

Dub.

Take of

Common salt, dried, five pounds ;
 Vitriolic acid,
 Water, each three pounds.

Add the acid, diluted with the water, after it has cooled, gradually to the salt, and then distil the liquor, until the residuum become dry.

The specific gravity of this acid is to that of distilled water, as 1160 to 1000.

IN this process the muriate of soda is decomposed, and the muriatic acid disengaged by the superior affinity of the sulphuric acid. But as muriatic acid is a permanently elastic fluid, the addition of the water is absolutely necessary for its existence in a fluid form. Some operators put a portion of water into the receiver, for the purpose of absorbing the muriatic acid gas, which is first disengaged; the colleges, however, order the whole of the water to be previously mixed with the sulphuric acid. This mixture must not be made in the retort itself; for the heat produced is so great, that it would not only endanger the breaking of the vessel, but occasion considerable loss and inconvenience by the sudden disengagement of muriatic gas.

The muriate of soda is directed to be heated to redness before it be introduced into the retort, that the whole of the water of

crystallization may be expelled, which being variable in quantity, would otherwise affect the strength of the acid produced; and besides, without this precaution, the acid obtained is too high-coloured.

If a common retort and receiver be employed for this distillation, they must not be luted perfectly closely; for if any portion of the gas should not be absorbed by the water employed, it must be allowed to escape; but the process will be performed with greater economy, and perfect safety, in a Woulfe's, or some similar apparatus.

The residuum in the retort consists principally of sulphate of soda, which may be purified by solution and crystallization.

If properly prepared, the muriatic acid is perfectly colourless, and possesses the other properties already enumerated; but in the shops it is very seldom found pure. It almost always contains iron, and very frequently sulphuric acid or copper. The copper is detected by the blue colour produced by super-saturating the acid with ammonia, the iron by the black or blue precipitate formed with tincture of galls or prussiate of potash. The sulphuric acid may be easily got rid of by re-distilling the acid from a small quantity of dried muriate of soda. But Mr. Hume discovered that muriate of baryta is precipitated when poured into muriatic acid, although it contain no sulphuric acid.

Medical use.—In its effects on the animal economy, and the mode of its employment, it coincides with the acids already mentioned, which almost proves that they do not act by oxygenizing the system, as the muriatic acid cannot be disoxygenized by any substance or process with which we are acquainted.

Off. prep.—Sulphas sodæ, *Ed. Lond. Dub.* Hydro-sulph. ammon. *Ed.* Murias barytæ, *Ed.* Solutio muriat. calcis, *Ed.*

Oxygenized Muriatic Acid.

THE vapours of this powerfully-oxygenizing acid have been recommended by Morveau as the best means of destroying contagion. As, however, they are deleterious to animal life, they cannot be employed in every situation. Where applicable, they are easily disengaged by mixing together ten parts of muriate of soda, and two parts of black oxide of manganese in powder, and pouring upon the mixture first four parts of water, and then six parts of sulphuric acid. Fumes of oxygenized muriatic acid are immediately disengaged.

Morveau has since contrived what he calls Disinfecting or Preservative phials. If intended to be portable, 46 grains of black oxide of manganese in coarse powder, are to be put into a strong glass phial of about 2³ cubic inches capacity, with an accurately-ground stopper, to which must be added about $\frac{45}{100}$ of a cubic inch

of nitric acid of 1.4 specific gravity, and an equal bulk of muriatic acid of 1.134, the stopper is then to be replaced, and the whole secured by inclosing the phial in a strong wooden case, with a cap which screws down so as to keep the stopper in its place. They are to be used by simply opening the phial without approaching it to the nose, and shutting it as soon as the smell of the muriatic gas is perceived. A phial of this kind, if properly prepared, will not lose its power after many years use. For small wards, strong bottles, with ground stoppers an inch in diameter, of about 25 or 27 cubic inches of capacity, may be used, with 372 grains of the oxide, and 3.5 inches of each of the acids, and the stopper kept in its place by leaden weights; or for larger wards, very strong glass jars, about 43 cubic inches in capacity, containing a drachm of the oxide, and 6 inches of each of the acids. These jars are to be covered with a plate of glass, adjusted to them by grinding with emery, and kept in its place by a screw. In no case is the mixture to occupy more than one third of the vessel.

ACIDUM ACETOSUM DESTILLATUM. *Ed.*

Distilled Acetous Acid,

Let eight pounds of acetous acid be distilled in glass-vessels, with a gentle heat. The two first pounds which come over, being too watery, are to be set aside; the next four pounds will be the distilled acetous acid. The remainder furnishes a still stronger acid, but too much burnt by the fire.

ACETUM DESTILLATUM. *Dub,*

Distilled Vinegar.

Take of

Vinegar, ten pounds.

Draw off, with a gentle heat, six pounds.

The specific gravity of this acid is to the weight of distilled water as 1004 to 1000.

Lond.

Take of

Vinegar, five pounds.

Distil with a gentle fire, in glass vessels, so long as the drops fall free from empyreuma.

VINEGAR, when prepared from vinous liquors by fermentation, besides acetous acid and water, contains extractive, super-tartrate of potash, and often citric or malic acid, alcohol, and a peculiar agreeable aroma. These substances, particularly the extractive and super-tartrate of potash, render it apt to spoil, and unfit for pharmaceutic and chemical purposes. By distillation, however, the acetic acid is easily separated from such of these substances as are not volatile. But by distillation it loses its agreeable flavour,

and becomes considerably weaker; for the water being rather more volatile than acetic acid, comes over first, while the last and strongest portion of the acid cannot be obtained free from empyreuma.

This process may be performed either in a common still or rather in a retort. The better kinds of wine-vinegar should be used. Indeed, with the best kind of vinegar, if the distillation be carried on to any great length, it is extremely difficult to avoid empyreuma. The best method of preventing this inconvenience is, if a retort be used, to place the sand but a little way up its sides, and when somewhat more than half the liquor is come over, to pour on the remainder a quantity of fresh vinegar equal to the liquor drawn off. This may be repeated three or four times; the vinegar supplied at each time being previously heated. The addition of cold liquor would not only prolong the operation, but also endanger the breaking of the retort.

Lowitz recommends the addition of half an ounce of recently-burnt and powdered charcoal to each pound of vinegar in the still, as the best means of avoiding empyreuma.

If the common still be employed, it should likewise be occasionally supplied with fresh vinegar, in proportion as the acid runs off, and this continued until the process can be conveniently carried no farther. The distilled acid must be rectified by a second distillation in a retort or glass alembic; for although the head and receiver be of glass or stone ware, the acid will contract a metallic taint from the pewter worm.

The residuum of this process is commonly thrown away as useless, although, if skilfully managed, it may be made to turn to good account, the strongest acid still remaining in it. Mixed with about three times its weight of fine dry sand, and committed to distillation in a retort, with a well-regulated fire, it yields an exceedingly strong empyreumatic acid. Besides, it is, without any rectification, better for some purposes, as being stronger, than the pure acid; particularly for making acetate of potash or soda: for in the process the empyreumatic oil is burnt out.

Distilled vinegar should be colourless and transparent; have a pungent smell, and purely acid taste, totally free from acrimony and empyreuma, and should be entirely volatile. It should not form a precipitate on the addition of a solution of baryta, or of water saturated with sulphuretted hydrogen; or change its colour when super-saturated with ammonia. These circumstances shew, that it is adulterated with sulphuric acid, or contains lead, copper, or tin.

Distilled acetous acid, in its effects on the animal economy, does not differ from vinegar, and as it is less pleasant to the taste, it is only used for pharmaceutical preparations.

Off. prep.—Acet. potass. *Ed. Lond. Dub.* Aqua acet. ammon

Ed. Lond. Dub. Acet. plumbi, *Ed. Lond. Dub.* Aqua lith. acetat. *Lond. Dub.*

ACIDUM ACETOSUM FORTE. *Edin.*

Strong Acetous Acid.

Take of

Sulphate of iron dried, one pound;

Acetite of lead, ten ounces.

Having rubbed them together, put them into a retort, and distil in a sand bath with a moderate heat, as long as any acid comes over.

ACIDUM ACETOSUM. *Lond.*

Acetous Acid.

Take of

Verdegris, in coarse powder, two pounds.

Dry it perfectly by means of a water bath saturated with sea-salt; then distil in a sand bath, and redistil the liquor obtained.

Its specific gravity is to that of distilled water as 1050 to 1000.

By these processes, the acid we have before noticed under the title of acetic acid, is prepared. It is now generally believed to differ from distilled vinegar only in strength, and in being perfectly free from all mucilaginous matter; therefore, according to the principles of nomenclature, which gives simple names to simple substances, the strong acid should be acetic acid, and our present acetous acid should be weak or dilute acetic acid.

Many different processes have been proposed for preparing acetic acid, but they may be arranged in three classes. It may be prepared,

1. By decomposing metalline acetates by heat.

2. ————— acetates by sulphuric acid.

3. ————— acetates by sulphates.

The process of the London college is an example of the first kind. But the heat necessary is so great, that it decomposes part of the acetic acid itself, and gives the product an empyreumatic and unpleasant smell.

By the superior affinity of sulphuric acid, the acid may be easily expelled from every acetate, whether alkaline or metallic; but part of the sulphuric acid seems to be deprived of its oxygen, and to be converted into sulphurous acid, which renders the product impure.

The processes of the last kind are preferable to the others in many respects. They are both more economical, and they furnish a purer acid. Mr. Lowitz directs one part of carefully-dried acetate of soda to be triturated with three parts of super-sulphate of potash, and the distillation to be conducted in a glass retort with a gentle heat. The Berlin college mix together twelve ounces of

fulphate of potash with six of sulphuric acid diluted with eighteen of water, and evaporate to dryness. With the super-fulphate of potash thus prepared they decompose nine ounces of acetate of soda dried with a gentle heat. The process of the Edinburgh college also belongs to this class, and was first proposed by C. Badollier, apothecary at Chartres.

Medical use.—It is almost solely used as an analeptic remedy in syncope, asphyxia, hysteric affections, and headaches. Applied to the skin, it acts as a stimulant and rubefacient, but it is most frequently snuffed up the nostrils in the state of vapour.

Off. prep.—Acidum acetosum camph. *Ed.*

ACIDUM BENZOICUM. *Edin.*

Take of

Benzoin, twenty-four ounces;
Carbonate of soda, eight ounces;
Water, sixteen pounds.

Triturate the benzoin with the carbonate, then boil in the water for half an hour, with constant agitation, and strain. Repeat the decoction, with other six pounds of water and strain. Mix these decoctions, and evaporate, until two pounds remain. Filter anew, and drop into the fluid, as long as it produces any precipitation,
Diluted sulphuric acid.

Dissolve the precipitated benzoic acid in boiling water, strain the boiling solution through linen, and set it aside to crystallize. Wash the crystals with cold water, dry and preserve them.

SAL BENZOINI. *Dub.*

Salt of Benzoin.

Take of

Benzoin, in coarse powder, one pound.

Place it in an earthen pot surrounded with sand, and let the matter which sublimes, arising with a gentle heat, be received in a conical paper capital.

It may be purified by solution in water, and crystallization.

FLORES BENZOES. *Lond.*

Flowers of Benzoin.

Take of

Benzoin, in powder, one pound.

Put it into an earthen pot placed in sand; and, with a slow fire, sublime the flowers into a paper cone fitted to the pot.

If the flowers be of a yellow colour, mix them with white clay, and sublime them a second time.

THE distinguishing character of balsams is their containing benzoic acid. It may be separated from the resin, which is their

other principal constituent, either by sublimation, or by combining it with a salifiable base. The London and Dublin colleges direct it to be done in the former way. But even with the greatest care it is almost impossible to manage the heat so as not to decompose part of the resin, and thus give rise to the formation of an empyreumatic oil, which destroys the product. Nor can it be freed completely from the empyreumatic oil by the solution and crystallization prescribed by the Dublin college, and still less by the second sublimation with clay, directed by that of London.

The other method of separating benzoic acid from resin, was first practised by Scheele, who employed lime-water; Götting afterwards used carbonate of potash; and, lastly, Gren used carbonate of soda, which has been adopted by the Berlin college, and now by that of Edinburgh. Mr. Brandé prefers Scheele's process, as the lime dissolves less of the resin of the benzoin than the alkalies do. In experiments, which he made for the purpose of ascertaining the comparative value of the different processes, he obtained from one pound of benzoin,

	Oz.	Dr.	Scr.	Gr.
By distillation, - - - - -	2	0	0	0
— Scheele's process, - - - - -	1	6	2	19
— Gren's and Götting's process - -	1	5	1	10
— boiling benzoin in water, - - -	1	0	0	10

As the crystallized acid, on account of its lightness and elasticity, is not easily reduced to powder, for most purposes it will be more convenient to keep it in the state of a precipitate.

It may also be extracted from storax, and all the other balsams, particularly those of Tolu or Peru; and from the urine of children, and of herbivorous animals.

The benzoic acid has an agreeable taste, and a fragrant smell, especially when heated. It is soluble in alcohol and in boiling water, but very sparingly in cold water, although it may be suspended in it, by means of sugar, so as to form an elegant balsamic syrup.

Off. prep.—Tinct. opii camph. *Lond. Dub.* Tinct. opii ammon. *Ed.*

OLEUM SUCCINI ET ACIDUM SUCCINI. *Edin.*

Oil of Amber and Succinic Acid.

Take of

Amber reduced to powder, and of pure sand, equal parts.
Mix them, and put them into a glass retort, of which the mixture may fill one half: then adapt a large receiver, and distil in a sand bath, with a fire gradually increased. At first, a watery liquor will come over, with some yellow oil; then a yellow oil, with an acid salt; and lastly, a reddish and black-coloured oil.

Pour the liquor out of the receiver, and separate the oil from the water. Press the salt collected from the neck of the retort and sides of the receiver between folds of blotting-paper, to free it from the oil adhering to it; then purify it by solution in warm water and crystallization.

SAL SUCCINI. *Dub.*

Salt of Amber.

Take of

Amber,

Pure sand, each one pound.

Distil, with a heat gradually increased, an acid liquor, an oil, and a salt discoloured with oil. Let the salt be dissolved in boiling water, and crystals formed by slow cooling.

SAL ET OLEUM SUCCINI. *Lond.*

Salt and Oil of Amber.

Take of

Amber, two pounds.

Distil in a sand heat gradually augmented; an acid liquor, oil, and salt loaded with oil, will ascend.

SAL SUCCINI PURIFICATUS. *Lond.*

Purified Salt of Amber.

Take of

Salt of amber, half a pound;

Distilled water, one pint.

Boil the salt in distilled water, and set aside the solution to crystallize.

WE are not acquainted with any experiments which determine whether the succinic acid exists as such in the amber, or whether it be a product of the decomposition of the amber by the action of heat, for in the process employed for obtaining succinic acid the amber is completely decomposed.

The sand is added by the Dublin college to prevent the amber from running together into masses, and impeding the distillation; but as it renders the residuum unfit for the use of the varnisher, it is not advisable. According to Götting, this distillation should be performed in a tubulated iron or earthen-ware retort, exposed to the immediate action of the fire; for he says, that, in a sand bath we cannot regulate the heat sufficiently, and that a glass retort is incapable of supporting the necessary temperature.

Besides the succinic acid collected from the neck of the retort, and sides of the receiver, the oil washes down a portion of it into the receiver, and the watery liquor which comes over is saturated with it. But the whole of it may be obtained by agitating the oil with some boiling water, which will dissolve the acid. This so-

lution is then to be added to the acid liquor, and the acid they contain is easily obtained by evaporation and crystallization. The acid may afterwards be purified by solution in boiling water and crystallization, according to the directions of the colleges.

But even after repeated solutions and crystallizations, a portion of empyreumatic oil still adheres to the acid, and renders it impure. Other methods of purifying it have been therefore attempted. Demachy saturated it with lime, separated the lime by sulphuric acid, and sublimed the succinic acid: Richter saturated succinic acid with potash, decomposed the salt formed with acetate of lead, and disengaged the succinic acid from the lead by means of diluted sulphuric acid: lastly, Morveau asserts that he obtained it in a state of perfect purity, by treating it with nitrous acid. It is often adulterated with muriate of ammonia, sulphuric acid, sulphate of potash, sugar, &c. When pure it is entirely volatile, gives out no ammoniacal fumes when triturated with potash, is not precipitated by solutions of baryta, and is soluble in alcohol.

Succinic acid, although retained in our pharmacopœias, is never used in medicine.

AQUA AËRIS FIXI. *Dub.*

Water Impregnated with Fixed Air.

Take of

White marble in powder, three ounces;

Diluted sulphuric acid, mixed with an equal quantity of water, a pound and a half.

Mix them gradually in a Nooth's apparatus, and let the air evolved pass through six pounds of pure spring water, placed in the upper part of the apparatus; and let agitation be occasionally employed until the water shall have acquired a sub-acid taste.

Carbonic acid may be separated from carbonate of lime.

a. By the action of heat alone.

b. By an acid having a superior affinity for the lime.

In the former way the carbonic acid is perfectly pure, in the latter it carries over a little of the stronger acid, which gives a slight degree of pungency.

IN this process the carbonic acid is separated from the carbonate of lime by the superior affinity of sulphuric acid. As it is disengaged, it assumes a gaseous form, and would be dissipated in the atmosphere, if it were not made to pass through water, which, at a medium temperature, is capable of absorbing about an equal bulk of this gas, and, by the assistance of pressure, a much greater proportion.

Various contrivances have been made for this purpose. Of these the most easily managed, and most convenient for general use, is

the apparatus of Nooth; and, for larger quantities, that of Woulfe, or some modification of it. By the proper application of pressure, M. Paul, of Geneva, now of London, is able to impregnate water with no less than six times its bulk of carbonic acid gas.

Med. use.—Water impregnated with carbonic acid, sparkles in the glass, has a pleasant taste, and forms an excellent, delicious beverage. It diminishes thirst, lessens the morbid heat of the body, and acts as a powerful diuretic. It is also an excellent remedy in increased irritability of the stomach, as in advanced pregnancy; and it is one of the best anti-emetics which we possess.

CHAP. III.

A L K A L I E S.

AQUA POTASSÆ; vulgo, LIXIVIUM CAUSTICUM. *Edin.*

Water of Potash, commonly called Caustic Ley.

Take of

Newly prepared lime, eight ounces;

Carbonate of potash, six ounces.

Put the lime into an iron or earthen vessel, with twenty-eight ounces of warm water. After the ebullition is finished, instantly add the salt; and having thoroughly mixed them, cover the vessel till they cool. When the mixture has cooled, agitate it well, and pour it into a glass funnel, whose throat must be obstructed with a piece of clean linen. Cover the upper orifice of the funnel, and insert its tube into another glass vessel, so that the water of potash may gradually drop through the rag into the lower vessel. As soon as it ceases to drop, pour into the funnel some ounces of water; but cautiously, so that it may swim above the matter. The water of potash will again begin to drop, and the affusion of water is to be repeated in the same manner, until three pounds have dropped, which will happen in the space of two or three days; then mix the superior and inferior parts of the liquor together by agitation, and keep it in a well-stopt phial.

AQUA KALI PURI. *Lond.*

Water of Pure Kali.

Take of

Prepared kali, four pounds;

Lime, six pounds;

Distilled water, four gallons.

Put four pints of water to the lime, and let them stand together for an hour; after which, add the kali and the rest of the water; then boil for a quarter of an hour; suffer the liquor to cool, and strain it. A pint of this liquor ought to weigh sixteen ounces.

If the liquor effervesce with any acid, add more lime, and boil the liquor and lime in a covered vessel for five minutes. Lastly, let it cool again, and strain it.

LIXIVIUM CAUSTICUM. *Dub.*
Caustic Ley.

Take of

Fresh burnt lime, eight ounces;

Mild vegetable alkali, six ounces.

Put the lime into an earthen vessel, and pour upon it thirty ounces of hot water. With the slaked lime immediately mix the salt, and cover the vessel. Pour the mixture, as soon as it is cooled, into a glass funnel, whose throat is obstructed with bits of stone covered with sand. Having covered the funnel, let the ley drop into a vessel placed to receive it; water being from time to time poured into the funnel, until three pounds have passed through. Let the liquor be agitated, and kept in a glass vessel well closed.

If the ley be rightly prepared, it will have neither colour nor smell, and will not effervesce when mixed with acids.

The specific gravity of this liquor is to that of distilled water as 1090 to 1000.

THESE processes do not differ materially. They are founded upon the affinity of lime being stronger than that of potash for carbonic acid. Of course, when lime comes in contact with carbonate of potash, the carbonic acid quits the potash to unite with the lime, and the results of the mixture are potash and carbonate of lime. Now, as the carbonate of lime is insoluble in water, and the potash is very soluble, they may be separated by filtration.

In doing this, however, we must take care to employ instruments on which the solution of potash does not act, and to prevent the free access of air, from which it would attract carbonic acid, and thus frustrate the whole operation. The latter object is attained by covering the upper or broad end of the funnel with a plate of glass, and inserting the lower end into the neck of a phial, which it fits pretty closely. The former object is attended with greater difficulties, and indeed scarcely to be effected, so powerful and general is the agency of potash. All animal substances are immediately attacked and destroyed by it; therefore, our filters cannot be made of silk, woollen, or paper which contains glue; and

although neither vegetable matters nor silica entirely escape its action, linen and sand are, on the whole, the least objectionable. A filter of sand was used by Dr. Black. He first dropt a rugged pebble into the tube of the funnel, in some part of which it formed itself a firm bed, while the inequalities on its surface afforded interstices of sufficient size for the passage of the filtering liquor. On the upper surface of this stone he put a thin layer of lint or clean tow; immediately above this, but not in contact with it, he dropped a stone similar to the former, and of a size proportioned to the swell in the upper part of the tube of the funnel. The interstices between this second stone and the funnel were filled up with stones of a less dimension, and the gradation uniformly continued till pretty small sand was employed. Finally, this was covered with a layer of coarser sand, and small stones, to sustain the weight of the fluid. A filter of sand being thus constructed in the funnel, it was washed perfectly clean by making clean water pass through it, till it dropt from the lower extremity of the funnel perfectly clear and transparent; and before using it, it was allowed to stand for some days, that no water might remain among the interstices of the sand.

From the spongy nature of the residuum which remains upon the filter, and especially if we use that of sand, a considerable quantity of the solution of potash will be retained. It is, however, easily obtained, by pouring gently over it, so as to disturb it as little as possible, a quantity of water; the ley immediately begins again to drop from the funnel, and as, from the difference of their specific gravity, the water does not mix with it, but swims above it, the whole ley passes through before any of the water. By means of the taste, we easily learn when the whole ley has passed.

As it is natural to suppose that the strongest solution will pass first, and the weakest last, we are directed to agitate the whole together, to render their strength uniform.

If the solution of potash be pure, it will be colourless, and it will neither effervesce with acids, nor form a precipitate with carbonate of potash. If it effervesces, carbonic acid is present, and must be separated by again boiling the solution with a little lime, or by dropping into it lime-water, as long as it produces any precipitate. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be separated by dropping into the ley a solution of the carbonate of potash. When we have thus purified our solution of potash, it must be again filtered.

Med. use.—The solution of caustic potash, under various names, has at different times been celebrated as a lithontriptic, and as often fallen again into disuse. The very contradictory accounts of its effects as a solvent are now in some degree explicable, since it has been discovered that urinary calculi are very different in

their natures, so that some of them are only soluble in acids, and others only in alkalies. Of the last description are the calculi of uric acid, which are very frequent, and those of urate of ammonia. On these, therefore, alkalies may be supposed to make some impression; and that alkalies, or alkaline carbonates, taken by the mouth, have occasionally relieved calculous complaints, is certain. It is, however, said that their continued use debilitates the stomach; and M. Fourcroy has proposed applying the remedy immediately to the disease, by injecting into the bladder a tepid solution of potash or soda, so dilute that it can be held in the mouth. Before the alkaline solution be injected, the bladder is to be completely evacuated of urine, and washed out with an injection of tepid water. After the alkaline injection has remained in the bladder half an hour or more, it is to be evacuated, and allowed to settle. If, on the addition of a little muriatic acid, a precipitate be formed, we shall have reason to conclude that the calculus contains uric acid, and that the alkali has acted on it.

Very dilute alkaline solutions may also be taken into the stomach as antacids, but we possess others which are preferable.

Externally, alkaline solutions have been more frequently used, either very dilute, simply as a stimulus, in rickets, gouty swellings, gonorrhœa, and spasmodic diseases, or concentrated as a caustic to destroy the poison of the viper, and of rabid animals.

Off. prep.—Sulphuret ant. præcip. *Edin. Lond. Dub.*

POTASSA; olim, CAUSTICUM COMMUNE ACCERRIMUM. *Ed.*
Potash; formerly, Strongest common Caustic.

Take of

The solution of potash, any quantity.

Evaporate it in a covered very clean iron vessel, till, on the ebullition ceasing, the saline matter flows gently like oil, which happens before the vessel becomes red. Then pour it out on a smooth iron plate; let it be divided into small pieces before it hardens, and immediately deposited in a well-stopt phial.

KALI PURUM. *Lond.*
Pure Kali.

Take of

Water of pure kali, one gallon,

Evaporate it to dryness; after which let the salt melt on the fire, and pour it out.

ALKALI VEGETABILE CAUSTICUM. *Dub.*
Caustic Vegetable Alkali.

Take of

Caustic ley, any quantity.

Evaporate it over the fire in a very clean iron vessel, until the ebullition having ceased, the saline matters, on increasing the

heat, remain almost at rest. Let the liquified salt be poured out upon an iron plate, and while it is congealing, be cut into proper pieces, which are immediately to be shut up in very close vessels.

THE principal thing to be attended to in this operation, is to conduct the evaporation so rapidly that the ley shall not absorb any carbonic acid from the atmosphere. As long as any water of solution remains, the ebullition is evident, and the evaporation is to be continued until it cease. The heat is then to be increased a little, which renders the potass perfectly fluid, and gives it the appearance of an oil, when it is ready to be poured out, either on a slab, as directed by the colleges, or into iron moulds, such as are used for the melted nitrate of silver.

The potass prepared according to these directions is sufficiently pure for medical use, but is not fit for chemical experiments. We can however obtain it perfectly white and crystallized, according to Berthollet, by adding to the ley, when evaporated so far that it would assume the consistence of honey, if permitted to cool, a quantity of alcohol equal to one third of the carbonate of potass operated on, mixing them together, and letting them boil a minute or two. The mixture is then to be poured into a glass vessel, and corked up, when the impurities will gradually subside, partly in a solid form, and partly dissolved in water. The super-natant alcoholic solution is then to be evaporated rapidly, till its surface become covered with a black crust, which is to be removed, and the liquid below is to be poured into a porcelain vessel, when it will concrete into a white substance, which is to be broken in pieces, and immediately excluded from the action of the air.

A less expensive way of obtaining potass perfectly pure is that of Lowitz. Evaporate a solution of potass till a thick pellicle form on its surface; allow it to cool; separate all the crystals formed, as they consist of foreign salts: renew the evaporation in an iron or silver basin; and remove the pellicles which form on the surface with an iron skimmer, as long as any appear. When the ebullition ceases, remove the vessel from the fire, and agitate the fused salt with an iron spatula while it cools. Dissolve the saline mass in twice its weight of water, and evaporate in a silver basin till it begins to crystallize. The crystals are pure potass. The fluid which swims over them has a dark-brown colour, and must be poured off: but if kept in a close-stopt phial, it will deposit its colouring matter, and by evaporation will furnish more crystals of potass.

Med. use.—Potass is only used as a caustic, or to form solutions of a known strength; and even its use as a caustic is inconvenient, from its being so quickly affected by the air, and from its rapid deliquescence, which renders it apt to spread.

Off. prep.—Alk. veget. sulph. *Dub.* Alcohol, *Lond. Dub. Æth.* sulph. *Ed. Lond. Dub.*

POTASSA CUM CALCE ; olim, CAUSTICUM COMMUNE MITIUS. *Edin.*

Potass with Lime, formerly Milder common Caustic.

Take of

Solution of potass, any quantity.

Evaporate in a covered iron vessel till one third remains ; then mix with it as much new-flaked lime as will bring it to the consistence of pretty solid pap, which is to be kept in a vessel closely stoppt.

CALX CUM KALI PURO. *Lond.*

Lime with Pure Kali.

Take of

Quicklime, five pounds and four ounces ;

Water of pure kali, sixteen pounds.

Boil away the water of pure kali to a fourth part ; then sprinkle in the lime, reduced to powder by the affusion of water. Keep it in a vessel closely stoppt.

CAUSTICUM MITIUS. *Dub.*

Milder Caustic.

Evaporate caustic ley to one third, then add powdered lime till it become thick, and form it into proper masses.

THE addition of the lime in these preparations renders them less apt to deliquesce, more easily managed, and milder in their operation.

CARBONAS POTASSÆ. *Edin.*

Carbonate of Potass.

Let impure carbonate of potass, called in English *pearl ashes*, be put into a crucible, and brought to a low red heat, that the oily impurities, if there be any, may be burnt out : then triturate it with an equal weight of water, and mix them thoroughly by agitation. After the feces have subsided, pour the liquor into a very clean iron pot, and boil to dryness, stirring the salt towards the end of the process, to prevent its sticking to the vessel.

KALI PRÆPARATUM. *Lond.*

Prepared Kali.

Take of

Potashes, two pounds.

Boiling distilled water, three pints.

Dissolve and filter through paper; evaporate the liquor till a pellicle appears on the surface; then set it aside for twelve hours, that the neutral salts may crystallize: after which, pour out the liquor, and boil away, with a slow fire, the whole of the water, constantly stirring, lest the salt should adhere to the pot.

In like manner is purified impure kali from the ashes of any kind of vegetable.

The same salt may be prepared from tartar, which should be burnt till it becomes of an ash colour.

ALKALI VEGETABILE MITE. *Dub.*

Mild Vegetable Alkali.

Take of

Potashes,

Boiling water, each six pounds.

Mix them by agitation in a glass vessel, and digest them for three days. Then pour off the pure liquor, and evaporate it to dryness in a very clean iron vessel. Towards the end of the operation, stir the saline mass constantly with an iron spatula. Then separate, by means of a sieve, the finer particles, which are to be kept in a glass vessel well stopped.

CARBONAS POTASSÆ PURISSIMUS; olim, SAL TARTARI. *Edin.*
Pure Carbonate of Potash; formerly Salt of Tartar.

Take of

Impure super-tartrate of potash, any quantity.

Wrap it up in moist bibulous paper, or put into a crucible, and burn it to a black mass, by placing it among live coals. Having reduced this mass to powder, expose it in an open crucible to the action of a moderate fire, till it become white, or at least of an ash-grey colour, taking care that it do not melt. Then dissolve it in warm water; strain the liquor through a linen cloth, and evaporate it in a clean iron vessel, diligently stirring it towards the end of the process with an iron spatula, to prevent it from sticking to the bottom of the vessel. A very white salt will remain, which is to be left a little longer on the fire till the bottom of the vessel becomes almost red. Lastly, when the salt is grown cold, keep it in glass vessels well stoped.

THE potash of commerce we have already shewn to contain a considerable proportion of foreign salts. By the process directed by the colleges, it is purified from those which are crystallizable; and although it still contains muriate of potash and silica, it is sufficiently pure for the purposes of medicine.

The purest carbonate of potash in common use is that obtained by incinerating the impure super-tartrate of potash, as all the substances it contains, except the potash, are decomposed by the heat. The tartaric acid and colouring matter are destroyed, and part of the carbonic acid, which is formed, unites with the potash.

But this salt, in whatever way obtained, is not strictly entitled to the appellation of carbonate; for it is not saturated with the acid, or rather it is a mixture of carbonate of potash and potash, in variable proportions. It is owing to the uncombined potash that it is still deliquescent, and in some degree caustic. It may be easily saturated, however, with carbonic acid, by exposing it in solution to the contact of the air for a considerable time, or by making a stream of carbonic acid gas pass through a solution of it, or by distilling it with carbonate of ammonia. M. Curadau has proposed a cheaper mode of saturating potash with carbonic acid. He dissolves the potash in a sufficient quantity of boiling water, mixes it with as much dried tanner's bark as to make it pretty dry, and then exposes the mixture in a covered crucible to the heat of a reverberatory furnace for half an hour. By lixiviation and crystallization, the mixture affords beautiful crystals of carbonate of potash. In this state it is crystallizable, and its crystals are permanent. It consists of about 43 acid, 40 potash, and 17 water. The saturation with carbonic acid is one of the best means of purifying it; for it always separates silica from the uncombined alkali.

Med. use.—Carbonate of potash is frequently employed in medicine, in conjunction with other articles, particularly for the formation of saline neutral draughts and mixtures: but it is used also by itself in doses from three or four grains to fifteen or twenty; and it frequently operates as a powerful diuretic, particularly when aided by proper dilution.

Off. prep.—Aqua potassæ, *Lond. Ed. Dub.* Aqua super-carbonatis potassæ, *Ed. Dub.* Acetis potass. *Ed. Lond. Dub.* Sulphas potassæ, *Ed.* Sulphur pot. *Ed. Lond.* Tartris pot. *Ed. Lond. Dub.* Sulph. stib. fuscum, *Dub.* Calx stibii, præcip. *Dub.* Alcohol, *Lond. Dub.*

AQUA KALI PRÆPARATI. *Lond.*

Water of Prepared Kali.

Take of

Prepared kali, one pound.

Set it in a moist place till it deliquesce, and then strain it.

LIXIVIUM MITE. *Dub.*

Mild Ley.

Take of

Mild vegetable alkali, one pound.

Dissolve it in one pound of water.

THE last of these preparations is a solution of the mixed or sub-carbonate of potash, in a fixed proportion of water; and the former is a solution of carbonate of potash, in a variable quantity of water. The Dublin solution contains the silica, and all the other impurities of the carbonate employed, while, according to

the London process, the uncombined portion of the potash, at the same time that it deliquesces, becomes saturated with carbonic acid, and deposits the silica. It would, therefore, be a very considerable improvement of this preparation, to dissolve crystallized carbonate of potash in a determined proportion of water.

Off. prep.—Calx hydrarg. alb. *Lond.*

AQUA SUPER-CARBONATIS POTASSÆ. *Ed.*

Solution of Super-carbonate of Potash.

Take of

Water, ten pounds;

Pure carbonate of potash, one ounce.

Dissolve and expose the solution to a stream of carbonic acid, arising from

Carbonate of lime in powder,

Sulphuric acid, each three ounces;

Water, three pounds, gradually and cautiously mixed.

The chemical apparatus invented by Dr. Nooth is well adapted for this preparation. But if a larger quantity of the liquor be required, the apparatus of Dr. Woulfe is preferable.

LIQUOR ALKALI VEGETABILIS MITISSIMI. *Dub.*

Solution of Mildest Vegetable Alkali.

Take of

Mild vegetable alkali, an ounce and a half;

Water, six pounds.

Mix them, and transmit fixed air through the liquor, according to the formula for preparing fixed air (p. 416), except that a double quantity of marble and acid must be employed to saturate the solution.

The colder the air is, and the greater the pressure, the better is the liquor, which should be kept in well-closed vessels.

As soon as the preparation is finished, the liquor should be drawn off into pint bottles, which are to be well corked, and kept in a cool situation, with the head down, or laid on one side. It should be perfectly transparent, and have an acidulous, not at all alkaline taste; and when poured out of the bottles, it should have a sparkling appearance.

Medical use.—In this solution, carbonate of potash is combined with excess of carbonic acid, by which means it is better adapted for internal use, as it is rendered not only more pleasant to the taste, but is less apt to offend the stomach. Indeed it is the only form in which we can exhibit potash in sufficient doses, and for a sufficient length of time, to derive much benefit from its use in calculous complaints. It has certainly been frequently of advantage in these affections, but probably only in those instances in which the stone consists of uric acid, or urate of ammonia: for although supersaturated with carbonic acid, yet the affinity of that acid for potash is so weak, that it really operates as an alkali.

Six or eight ounces may be taken two or three times a-day. It in general proves powerfully diuretic, and sometimes produces inebriation. This last effect is ascribed to the carbonic acid.

ACETIS POTASSÆ. *Ed.*

Acetite of Potass.

Take of

Pure carbonate of potass, one pound.

Boil it with a very gentle heat, in four or five times its weight of distilled acetous acid, and add more acid at different times, till, on the watery part of the preceding quantity being nearly dissipated by evaporation, the new addition of acid ceases to raise any effervescence, which will happen, when about twenty pounds of acid have been consumed. It is then to be slowly dried. The impure salt remaining, is to be melted with a gentle heat, for a short time, and afterwards dissolved in water, and filtered through paper. If the liquefaction has been properly performed, the filtered liquor will be limpid; but if otherwise, of a brown colour. Afterwards evaporate this liquor with a very gentle heat in a very shallow glass vessel, occasionally stirring the salt as it becomes dry, that its moisture may be sooner dissipated. Lastly, the acetite of potass ought to be kept in a vessel very closely stoppt, to prevent it from deliquescing.

KALI ACETATUM. *Land.*

Acetated Kali.

Take of

Prepared kali, one pound.

Boil it, with a slow fire, in four or five times its quantity of distilled vinegar; and when the effervescence ceases, add, at different times, more distilled vinegar, until one portion of vinegar being nearly evaporated, the addition of another will excite no effervescence, which will happen when about twenty pounds of distilled vinegar are consumed; afterwards let it be dried slowly. An impure salt will be left, which is to be melted for a little while with a slow fire; then dissolved in water, and filtered through paper.

If the fusion has been rightly performed, the strained liquor will be colourless; if otherwise, of a brown colour.

Lastly, evaporate this liquor with a slow fire, in a very shallow glass vessel; frequently stirring the mass, that the salt may be more completely dried, which should be kept in a vessel closely stoppt.

The salt ought to be very white, and dissolve wholly, both in water and spirit of wine, without leaving any feces. If the salt, although white, should deposit any feces in spirit of wine, the solution should be filtered through paper, and the salt

ALKALI VEGETABILI ACETATUM; olim, SAL DIURETICUS.

Dub.

Acetated Vegetable Alkali, formerly Diuretic Salt.

Take of

Mild vegetable alkali, any quantity.

Add to it at different times, about five times its weight of distilled vinegar, at a moderate temperature. When the evaporation ceases, and the liquor is somewhat evaporated, add, at intervals, distilled vinegar, until the mixture shall entirely cease to effervesce. Then evaporate to dryness; and having increased the fire a little, bring the saline mass into a state of fusion. Dissolve the salt, after it has cooled, in water: filter the solution, and evaporate, until, on cooling, it shall concrete into a crystalline mass, which should be very white. Put this, while still warm, into vessels accurately closed.

THIS is both a troublesome and expensive preparation, for when attempted to be made by simply evaporating to dryness, the salt has always a dark, unpleasant colour, which can neither be removed by repeated solution and crystallization, nor even by solution in alcohol. It is doubtful to what the colour is owing. It has been ascribed by some to part of the acetic acid being decomposed by heat during the exsiccation of the salt: they accordingly recommend the evaporation to be conducted very gently, and the pellicles to be skimmed from the surface of the liquor as fast as they are formed; and in this way, they say, they have procured at once a very white salt. Others ascribe it to some foreign matter which rises in distillation with the last portions of the acetous acid, and therefore direct, that only the first portions which come over should be used, or that the acetous acid should be distilled with charcoal: while others again ascribe it to accidental impurities contracted during the operation, and recommend the utmost attention to cleanliness, and the use of earthen vessels. To whatever cause it may be owing, and the second appears to us the most probable, the colour is most effectually destroyed by fusing the salt. The heat necessary to do this decomposes the colouring matter; and on dissolving the fused mass in water, and filtering the solution, we find a fine light charcoal on the filter. But this fusion is attended with considerable loss, for part of the acetic acid itself is decomposed.

The operator must be particularly careful, in melting it, not to use a greater heat, nor to keep it longer liquified, than what is absolutely necessary: a little should be occasionally taken out, and put into water; and as soon as it begins to part freely with its black colour, the whole is to be removed from the fire.

The exsiccation of the solution of the salt, after it has been fused, must be conducted very carefully, as it is exceedingly apt to be decomposed, which would render a new solution and ex-

diccation necessary. The test of its purity, by dissolving it in alcohol, as directed by the London college, is to discover if any of the acetous acid itself has been decomposed in the operation; for the carbonate of potash, which is in that case formed, is insoluble in alcohol.

To spare trouble and expence, attempts have been made to prepare acetate of potash with undistilled vinegar, and even with the residuum of the distillation of acetic acid: and they have been to a certain degree successful: but as repeated fusion and crystallization are necessary to bring the salt to a sufficient degree of purity, it does not appear that they were more economical. But if to acetate of potash prepared with impure vinegar, we add a sufficient quantity of sulphuric acid, by distillation we obtain an acetic acid of great strength, which forms a beautiful acetate of potash without fusion. Lastly, this salt may be prepared by the decomposition of acetates; for example, of the acetate of lime by tartrate of potash.

Acetate of potash has a sharp, somewhat pungent taste. It is soluble at 60°, in about its own weight of water. It is also soluble in alcohol. It is deliquescent. It is decomposed by the stronger acids; by a decoction of tamarinds; by the sulphate of soda and magnesia; by muriate of ammonia; by the tartrate of soda and potash; and by some metalline salts. Its acid is destroyed by a high temperature.

Medical use.—Acetate of potash, which way soever prepared, provided it be properly made, is a medicine of great efficacy, and may be so dosed and managed as to prove either mildly cathartic, or powerfully diuretic; few of the saline deobstruents equal it in virtue. The dose is from half a scruple to a drachm or two. A simple solution, however, of alkaline salt in vinegar, without effication, is perhaps not inferior as a medicine to the more expensive salt. Two drachms of the alkali, saturated with vinegar, have been known to occasion, in hydropic cases, ten or twelve stools, and a plentiful discharge of urine, without any inconvenience.

Off. prep.—Tinctura ferri acetati. *Dub.* Acetis hydrarg. *Ed.* *Lond. Dub.*

NITRUM PURIFICATUM. *Lond.*

Purified Nitre.

Take of

Nitre, two pounds;

Distilled water, four pints.

Boil the nitre in the water, till it be dissolved; strain the solution, and set it aside to crystallize.

COMMON nitre contains usually a considerable portion of muriate of soda, which in this process is separated, for it remains dissolved after the greatest part of the nitrate of potash has crystallized. The

crystals which shoot after the first evaporation are large, regular, and pure: but when the remaining liquor is further evaporated, and this repeated a second or third time, the crystals prove at length small, imperfect, and tipped with little cubical crystals of muriate of soda. When pure, their solution is not affected by nitrate of silver, or nitrate of baryta.

SULPHAS POTASSÆ; olim, TARTARUM VITRIOLATUM.
Edin.

Sulphate of Potass, formerly Vitriolated Tartar.

Take of

Sulphuric acid, diluted with six times its weight of water, any quantity.

Put it into a capacious glass vessel, and gradually drop into it, of pure carbonate of potass, dissolved in six times its weight of water, as much as is sufficient thoroughly to neutralize the acid. The effervescence being finished, strain the liquor through paper; and after evaporation, set it aside to crystallize.

Sulphate of potass may be also conveniently prepared from the residuum of the distillation of nitrous acid, by dissolving it in warm water, and saturating it with carbonate of potass.

KALI VITRIOLATUM. *Lond.*
Vitriolated Kali.

Take of

The salt which remains after the distillation of the nitrous acid, two pounds;

Distilled water, two gallons.

Burn out the superfluous acid with a strong fire, in an open vessel: then boil it a little while in the water; strain, and set the liquor aside to crystallize.

ALKALI VEGETABILE VITRIOLATUM. *Dub.*
Vitriolated Vegetable Alkali.

Let the salt which remains after the distillation of nitrous acid reduced to powder, be dissolved in a sufficient quantity of boiling water. Let the filtered liquor be evaporated with a very gentle heat, that it may crystallize.

THIS salt is very seldom prepared on purpose, as it may be obtained from the residuum of many other preparations, by simple solution and crystallization. For so strong is the affinity between sulphuric acid and potass, that they scarcely ever meet without combining to form this salt. All the sulphates, except that of baryta are decomposed by potass and most of its combinations; and reciprocally, all the compounds of potass are decomposed by sulphuric acid and most of its combinations; and in all these decompositions, sulphate of potass is one of the products.

The greatest part of the sulphate of potass of commerce is obtained from the residuum of the distillation of sulphate of iron with nitrate of potass, by lixiviating it, supersaturating the solution with carbonate of potass, filtering it boiling hot, and allowing it to crystallize. The liquor remaining after the precipitation of magnesia, is also a solution of sulphate of potass. It is also got in considerable quantities from the residuum remaining in the retort, after the distillation of nitrous acid; and all the colleges have given directions for obtaining it in this way. This residuum generally contains an excess of acid, which converts part of the sulphate into super-sulphate of potass. The Dublin college allow this part to be lost. The London drive off the excess of acid by intense heat, and thus get the whole of the sulphate; but at the same time convert it into a very difficultly soluble mass. While the Edinburgh college, more scientifically economical than either, derive advantage from the excess of acid, by simply saturating it with carbonate of potass.

As the residuum of the distillation of nitrous acid may not always be at hand, the Edinburgh college also give a receipt for making this salt, by directly combining its constituents. It would have been more economical to have used a solution of sulphate of iron, in place of sulphuric acid, by which means not only an equally pure sulphate of potass would have been procured at less expence, but also a very pure carbonate of iron.

Sulphate of potass forms small transparent very hard crystals, generally aggregated in crusts and permanent in the air. It has a bitter taste, is slowly soluble in water, requiring 16 parts at 60°, and 4 at 212°. It is not soluble in alcohol. It decrepitates when thrown on live coals, and melts in a red heat. It consists of 45.2 acid, and 54.8 potass. It is decomposed by the barytic salts; by the nitrates and muriates of lime and of strontia, by the tartrates partially; and by the salts of mercury, silver and lead.

Medical use.—Sulphate of potass, in small doses, as a scruple or half a drachm, is an useful aperient; in larger ones, as four or five drachms, a mild cathartic, which does not pass off so hastily as the sulphate of soda, and seems to extend its action further.

Off. prep.—Pulv. ipec. et opii. *Ed. Lond. Dub.* Pulv. scam. comp. *Lond.*

SULPHAS POTASSÆ CUM SULPHURE; olim SAL POLYCHRESTUS. *Ed.*

Sulphate of Potass with Sulphur, formerly Sal Polychrest.

Take

Nitrate of potass in powder,
Sublimed sulphur, of each equal parts.

Mingle them well together, and inject the mixture, by little and little at a time, into a red-hot crucible : the deflagration being over, let the salt cool, after which it is to be put up in a glass vessel well stopped.

In this process the nitric acid of the nitrate of potass is decomposed by the sulphur, which is in part acidified. But the quantity of oxygen contained in the nitric acid, is not always sufficient to acidify the whole sulphur employed ; therefore part of it remains in the state of sulphureous acid, which is probably chemically combined with part of the potass in the state of sulphite, for the whole saline mass formed, is more soluble in water than sulphate of potass. It is crystallizable, and by exposure to the air, gradually attracts oxygen, and is converted into sulphate of potass. In some experiments which I made to determine the state in which the sulphur existed in this salt, carefully prepared, it seemed to be sulphuric acid ; for it neither gave out a sulphureous smell on the addition of sulphuric acid, nor was a solution of it precipitated by acids. In its medical effects and exhibition, it agrees with sulphate of potass.

Off. prep.—Pil aloes cum colocynth.

SULPHURETUM POTASSÆ; olim, HEPAR SULPHURIS.
Edin.

Sulphuret of Potass, formerly Liver of Sulphur.

Take of

Carbonate of potass.

Sublimed sulphur, each eight ounces.

Grind them well together, put them into a large coated crucible ; fit a cover to it, and having applied live coals cautiously around it, bring them at length to a state of fusion.

Break the crucible as soon as it has grown cold, take out the sulphuret, and keep it in a well-closed phial.

KALI SULPHURATUM. *Lond*
Sulphuretted Kali.

Take of

Flowers of sulphur, one ounce ;

Prepared kali, five ounces.

With the sulphur melted with a gentle fire, mix the salt by constant agitation until they unite.

ALKALI VEGETABILE SULPHURATUM. *Dub.*
Sulphuretted Vegetable Alkali.

Take of

Caustic vegetable alkali in powder.

Sublimed sulphur, each two ounces.

To the sulphur, melted by a gentle heat, add the alkali ; covering the vessel, if the mixture shall take fire.

THERE exists a very strong affinity between sulphur and potass, but they must be united in a state of perfect dryness ; because, if any moisture be present, it is decomposed, and alters the nature of the product. If potass be employed as directed by the Dublin college, it will unite with the sulphur by simple trituration, and will render one third of its weight of sulphur soluble in water. If carbonate of potass be used as directed by the other colleges, it is necessary to bring the sulphur into a state of fusion ; it then acts upon the carbonate, and expels the carbonic acid. It is evident, that to combine with the same quantity of sulphur, a larger proportion of carbonate of potass than of potass is necessary ; but the quantity ordered by the London college is certainly much too large. Götting directs only one part of carbonate of potass to two of sulphur : and to save the crucible, he directs the mixture, as soon as it melts, to be poured into a heated mould, anointed with oil. The colleges also differ in the mode of conducting the process. The London and Dublin colleges direct the alkaline salt to be projected upon the melted sulphur. The fault of this process is, that there is a considerable loss of sulphur by sublimation, which is avoided, if the substances be previously intimately mixed, and brought into fusion by a very gradual and cautious application of heat, according to the process of the Edinburgh college ; but, if the fusion be not very cautiously performed, the sudden extrication of so large a quantity of carbonic acid gas, is apt to throw the melted matter out of the crucible, and may be attended with unpleasant consequences. La Grange projects one part of sulphur, on one and a half of potass in fusion, and keeps the compound melted half an hour before he pours it out. If the heat be too great, and the crucible uncovered, the sulphureous vapour is apt to inflame, but it is easily extinguished by covering it up. For the preparation of precipitated sulphur, Hermstadt proposes to obtain the sulphuret of potass, by heating together in a crucible four parts of sulphate of potass with one of charcoal powder. The charcoal is converted into carbonic acid gas, and the sulphate into sulphuret.

Sulphuret of potass, properly prepared, is of a liver-brown colour, hard, brittle, and has a vitreous fracture. It has an acrid bitter taste, and the smell of sulphur. It is exceedingly prone to decomposition. It is deliquescent in the air, and is decomposed. It is very fusible, but a strong heat separates the sulphur by sublimation. The moment it comes in contact with water, there is a mutual decomposition. Part of the sulphur becomes acidified, deriving oxygen from the water, and forms sulphate of potass. Part of the hydrogen of the water decomposed, combines with

another portion of the sulphur, and escapes in the form of sulphuretted hydrogen gas: another portion of the hydrogen combines with a third portion of the sulphur, and remains in solution, united with the alkali, in the state of hydroguretted sulphuret of potass. By acids, sulphuret of potass is immediately decomposed; the acid forms a neutral salt with the potass, and the sulphur is separated.

Off. Prep.—Sulph. præc. *Lond. Dub.*

TARTRIS POTASSÆ; olim, TARTARUM SOLUBILE. *Ed.*

Tartrite of Potass, formerly, Soluble Tartar.

Take of

Carbonate of potass, one pound;

Super-tartrite of potass, three pounds, or as much as may be sufficient;

Boiling water, fifteen pounds.

To the carbonate of potass dissolved in the water, gradually add the super-tartrite of potass in fine powder, as long as it raises any effervescence, which generally ceases before three times the weight of the carbonate of potass has been added; then strain the cooled liquor through paper, and after due evaporation set it aside to crystallize.

KALI TARTARISATUM. *Lond.*

Tartarised Kali.

Take of

Prepared kali, one pound;

Crystals of tartar, three pounds;

Distilled water, boiling, one gallon.

To the salt, dissolved in the water, throw in gradually the crystals of tartar powdered: filter the liquor, when cold, through paper; and, after due evaporation by a gentle heat, set it apart to crystallize.

ALKALI VEGETABILE TARTARISATUM. *Dub.*

Tartarised Vegetable Alkali.

Take of

Mild vegetable alkali, one pound;

Crystals of tartar in very fine powder, two pounds and a half,

Boiling water, fifteen pounds.

Gradually add the tartar to the vegetable alkali dissolved in the water; after the liquor has cooled, strain it through paper, evaporate it, and let it crystallize by cooling slowly.

THE tartaric acid is capable of uniting with potass in two proportions, forming in the one instance a neutral, and in the other

an acidulous salt. The latter is an abundant production of nature, but it is easily converted into the former, by saturating it with potass, or by depriving it of its excess of acid. It is by the former method that the colleges direct tartrate of potass to be prepared, and the process is so simple, that it requires little comment. For the sake of economy, we should come as near the point of saturation as possible; but any slight deviation from it will not be attended with much inconvenience. Indeed, it is perhaps advisable to leave a slight excess of acid, which, forming a small quantity of very insoluble salt, leaves the remainder perfectly neutral. The evaporation must be conducted in an earthen vessel, for iron discolours the salt. It is easily crystallized, and the crystals become moist in the air. It has an unpleasant bitter taste. It is soluble in four parts of cold water, and still more soluble in boiling water, and it is also soluble in alcohol. It is totally or partially decomposed by all acids. On this account it is improper to join it with tamarinds, or other acid fruits; which is too often done in the extemporaneous practice of those physicians who are fond of mixing different cathartics together, and know little of chemistry. It is also totally decomposed by lime, baryta, strontia, and magnesia, and partially by the sulphates of potass, soda, and magnesia, and by the muriate of ammonia.

Medical use.—In doses of a scruple, half a drachm, or a drachm, this salt is a mild cooling aperient: two or three drachms commonly loosen the belly; and an ounce proves pretty strongly purgative. It has been particularly recommended as a purgative for maniacal and melancholic patients. It is an useful addition to the purgatives of the resinous kind, as it promotes their operation, and at the same time tends to correct their griping quality.

CARBONAS SODÆ; olim, SAL ALKALINUS FIXUS FOSSILIS PURIFICATUS. *Ed.*

Carbonate of Soda, formerly, Purified Fixed Fossil Alkaline Salt.

Take of

Impure carbonate of soda, any quantity.

Bruise it; then boil in water till all the salt be dissolved. Strain the solution through paper, and evaporate it in an iron vessel, so that after it has cooled, the salt may crystallize.

NATRON PRÆPARATUM. *Lond.*

Prepared Natron.

Take of

Barilla, powdered, two pounds;

Distilled water, one gallon.

Boil the barilla in four pints of water for half an hour, and strain. Boil the residuum with the rest of the water, and strain. Evaporate the mixed liquors to two pints, and set them by for eight days; strain this liquor again; and, after due boiling, set it aside to crystallize. Dissolve the crystals in distilled water; strain the solution, boil, and set it aside to crystallize.

ALKALI FOSSILE MITE. *Dub.*
Mild Fossil Alkali.

Take of

Barilla, in powder, ten pounds;
 Water, forty pounds.

Boil the barilla in the water, in a covered vessel, for two hours, agitating it from time to time. Evaporate the filtered solution in a wide iron vessel to dryness, taking care that the saline mass remaining be not liquefied by too great a degree of heat, and agitate it with an iron spatula, until its colour become white. Lastly, dissolve it in boiling water; evaporate, and let it crystallize by slow refrigeration.

If the salt be not pure, repeat the solution and crystallization.

THESE directions are principally intended for the purification of the Spanish barilla, which is a fused mass, consisting indeed principally of carbonate of soda, but also containing charcoal, earths, and other salts. From the two first causes of impurity it is easily separated by solution and filtration, and the salts may be separated by taking advantage of their different solubility in cold and in hot water. Frequently the soda does not crystallize freely, from not being saturated with carbonic acid, which is the reason why the London college order the solution to be exposed to the atmosphere for eight days, that it may absorb carbonic acid, before they attempt the crystallization of the salts. But the preparation of carbonate of soda, by the decomposition of sulphate of soda, has now become a manufacture, and is carried to such perfection, that its further purification is almost unnecessary for the purposes of the apothecary.

Off. prep.—Aqua super-carb. sodæ. *Ed.* Phosphas sodæ, *Ed.* Cartris pot. et sod. *Ed. Lond. Dub.* Carbonas ferri præcip. *Ed.* Acid benzoic, *Ed.*

AQUA SUPER CARBONATIS SODÆ. *Ed.*
Water of Super-Carbonate of Soda.

This is prepared from ten pounds of water, and two ounces of carbonate of soda, in the same manner as the water of super-carbonate of potass.

By super-saturating soda with carbonic acid, it is rendered more agreeable to the palate, and may be taken in larger quantities, without affecting the stomach.

PHOSPHAS SODÆ. *Ed.*

Phosphate of Soda.

Take of

Bones burnt to whiteness, and powdered, ten pounds;
Sulphuric acid, six pounds;
Water, nine pounds.

Mix the powder with the sulphuric acid in an earthen vessel, then add the water, and mix again. Then place the vessel in a vapour bath, and digest for three days; after which dilute the mass with nine pounds more of boiling water, and strain the liquor through a strong linen cloth, pouring over it boiling water, in small quantities at a time, until the whole acid be washed out. Set by the strained liquor, that the impurities may subside, decant the clear solution, and evaporate it to nine pounds. To this liquor, poured from the impurities, add carbonate of soda, dissolved in warm water, until the effervescence ceases. Filter the neutralized liquor, and set it aside to crystallize. To the liquor that remains after the crystals are taken out, add a little carbonate of soda, if necessary, so as to saturate exactly the phosphoric acid, and dispose the liquor, by evaporation to form crystals. Lastly, the crystals are to be kept in a well-closed vessel.

THE first part of this process consists in destroying the gelatin of the bones by the action of heat. When burnt to perfect whiteness, they retain their form, but become friable, and consist of phosphate of lime, mixed with a very little carbonate of lime and carbonate of soda. In performing this part of the process, we must take care not to heat the bones to a bright red, as by it they undergo a kind of semi-fusion, and become less soluble. The complete combustion of the charcoal is facilitated by the free contact of the air; we must therefore bring every part in succession to the surface, and break the larger pieces.

In the second part of the process, the phosphate of lime is decomposed by the sulphuric acid. This decomposition is however only partial. The sulphuric acid combines with part of the lime, and forms insoluble sulphate of lime. The phosphoric acid separated from that portion of lime, immediately combines with the rest of the phosphate of lime, and forms super-phosphate of lime, which is not farther decomposable by sulphuric acid.

The super-phosphate of lime, thus formed, is soluble in water, but as the sulphate of lime, with which it is mixed, concretes in

a very solid mass, it is in some measure defended from the action of water. On this account the whole mass is directed to be digested for three days in vapour, by which means it is thoroughly penetrated and prepared for solution in the boiling water, which is afterwards poured on it. It is probably to render the subsequent solution easier, that Thenard directs the bone-ashes to be made into a thin paste (*bouillie*) with water, before the sulphuric acid is added to them.

Having thus got a solution of super-phosphate of lime, it is next decomposed by carbonate of soda, dissolved in water. This decomposition, likewise, is only partial, as it deprives the super-phosphate of lime of its excess of acid only, and reduces it to the state of phosphate. The phosphate of lime, being insoluble, is easily separated by filtration, and the phosphate of soda remains in solution. According to Thenard, the nicest point in the whole process, is the determination of the proper quantity of carbonate of soda to be added. As the phosphate of soda does not crystallize freely unless there be a slight excess of base, he directs that a little more carbonate of soda be added than what is merely sufficient to saturate the excess of acid in the super-phosphate of lime, but not to continue the addition until it cease to produce any precipitate. We must also take care not to carry the evaporation of a solution of phosphate of soda so far as to form a pellicle, for it then concretes into an irregular mass, and does not form beautiful crystals. After each crystallization, we must examine the liquor which remains, and if it be acid, or merely neutral, add to it a little of the solution of carbonate of soda. In this way Thenard got from 2100 parts of bone-ashes, 700 of sulphuric acid, and 667 of carbonate of soda, 885 of phosphate of soda. According to Fourcroy, phosphate of lime consists of 0.41 acid and 0.59 lime, and super-phosphate of lime of 0.54 acid and 0.46 lime; phosphate of lime, treated with sulphuric acid, is only deprived of 0.24 lime, and changed into 0.76 of super-phosphate, consisting of 0.59 phosphate of lime, and 0.17 phosphoric acid, and it is only with this portion of acid that we are able to combine soda. Fourcroy is also of opinion, that phosphate of lime requires only 0.4 of its weight of sulphuric acid to decompose it, whereas 0.6 are employed by the Edinburgh college, and others use even 0.7. This is not only, therefore, a waste of acid, but renders the product impure, by being mixed with sulphate of soda, which is sometimes actually the case in the phosphate of soda of commerce. Besides, as bone-ashes are of a very little value, it is better that a portion of them should escape undecomposed, than that an excess of acid should be added to them.

Mr. Funcke, of Linz, has discovered a still more economical and expeditious method. It consists in saturating the excess of lime in

calcined bones with diluted sulphuric acid, and then dissolving the remaining phosphate of lime in nitric acid. To this solution he adds an equal quantity of sulphate of soda, and then recovers the nitric acid by distillation. The phosphate of soda is then separated from the sulphate of lime, by the affusion of water and crystallization.

Phosphate of soda crystallizes in rhomboidal prisms, terminated by three-sided pyramids. Its taste resembles that of common salt. At 60° it is soluble in four parts of water, and at 212° in two. It effloresces in the air. By heat it undergoes the watery fusion, and at last melts into a white mass. It consists, according to Thenard, of 15 phosphoric acid, 19 soda, and 66 water of crystallization. It is decomposed by most of the salts having an earthy base.

Medical use.—Phosphate of soda was introduced into the practice of physic by the ingenious Dr. Pearson of Leicester square, London. It possesses the same medical qualities as sulphate of soda, and the tartrate of potash and soda, being an excellent purge in the quantity of an ounce or ten drachms; and has the peculiar advantage over these two salts of being much less nauseous than they are. Its taste is extremely similar to that of common salt; and when given in a basin of water-gruel, or veal-broth made without salt, it is scarcely perceptible by the palate, and consequently is well adapted for patients whose stomachs are delicate, and who have an antipathy against the other salts. The only objection to its general use is the very great difference between its price and that of sulphate of soda, a difference which might certainly be diminished.

MURIAS SODÆ EXSICCATUS. *Ed.*

SAL COMMUNIS EXSICCATUS. *Dub.*

Dried Muriate of Soda, Dried Common Salt.

Take of

Common salt, any quantity.

Roast it over the fire in a wide iron vessel, until it ceases to decrepitate, agitating it from time to time.

By this process the muriate of soda is reduced into the state in which it is employed for the distillation of muriatic acid. It not only deprives it entirely of its water of crystallization, which, from being variable in quantity, would otherwise render the acid obtained unequal in strength, but also destroys some colouring matter it contains; for if we prepare muriatic acid from crystallized muriate of soda, we obtain a coloured muriatic acid, while the dried muriate furnishes a perfectly colourless one.

Off. Prep.—Acid muriat. *Ed. Lond. Dub.* Murias hydrarg. *Ed. Lond. Dub.*

SULPHAS SODÆ; olim, SAL GLAUBERI. *Ed.**Sulphate of Soda; formerly, Glaubers Salt.*

Dissolve the acidulous salt which remains after the distillation of muriatic acid, in water; and having mixed chalk with it to remove the superfluous acid, set it aside until the sediment subsides, then evaporate the liquor decanted from them, and strain through paper, so that it may crystallize.

NATRON VITRIOLATUM. *Lond.**Vitriolated Natron.*

Take of

The salt which remains after the distillation of the muriatic acid,
two pounds;

Distilled water, two pints and a half.

Burn out the superfluous acid with a strong fire, in an open vessel; then boil it for a little in the water: strain the solution, and set it by to crystallize.

ALKALI FOSSILE VITRIOLATUM. *Dub.**Vitriolated Fossil Alkali.*

Reduce the salt, which remains after the distillation of muriatic acid, to powder, and dissolve it in a sufficient quantity of boiling water. Evaporate the filtered solution, and crystallize the salt by slow refrigeration.

THE observations we made respecting the different methods followed by the colleges, for extracting sulphate of potash from the residuum of the distillation of nitrous acid, apply in the present instance, except that the Edinburgh college do not preserve the superabundant acid when present, by saturating it with carbonate of soda, but get rid of it by saturating it with carbonate of lime, with which it forms an insoluble sulphate of lime. In fact, the price of sulphate of soda is so very small, that it would be no economy to use carbonate of soda to saturate the superabundant acid.

By far the greatest part of the sulphate of soda is obtained from manufacturers, as a result of processes performed for the sake of other substances, as in the preparation of muriate of ammonia, oxygenized muriatic acid, &c. It may be economically obtained by making into a paste with a sufficient quantity of water, eight parts of burnt gypsum, five of clay, and five of muriate of soda. This mixture is burnt in a kiln or oven, then ground to powder, diffused in a sufficient quantity of water, and after being strained, is evaporated and crystallized.

Sulphate of soda crystallizes in six-sided prisms, terminated by

dihedral summits. The crystals are often irregular, and their sides are usually channelled. Their taste is at first salt, and afterwards disagreeably bitter. They are soluble in 2.67 parts of water at 60°, and in 0.8 at 212°. In the air they effloresce. They undergo the watery fusion, and in a red heat melt. They consist of 23.52 sulphuric acid, 18.48 soda, and 58 water; when dried at 700°, of 56 acid and 44 soda. It is decomposed by baryta and potash, and salts containing these bases, and by the salts of silver, mercury, and lead.

Medical use.—Taken from half an ounce to an ounce, or more, it proves a mild and useful purgative; and in smaller doses, largely diluted, a serviceable aperient and diuretic. It is commonly given in solution, but it may also be given in powder, after it has effloresced. In this form the dose must be reduced to one half.

TARTRIS POTASSÆ ET SODÆ; olim, SAL RUPELLENSIS.
Edin.

Tartrate of Potash and Soda, formerly Rochelle Salt.

It is prepared from the carbonate of soda and super-tartrate of potash, in the same manner as the tartrate of potash.

NATRON TARTARISATUM. *Lond.* SAL RUPELLENSIS. *Dub.*
Tartarified Natron. *Rochelle Salt.*

Take of

Natron, twenty ounces;

Crystals of tartar, powdered, two pounds;

Distilled water, boiling, ten pints.

Dissolve the natron in the water, and gradually add the crystals of tartar: filter the liquor through paper; evaporate, and set it aside to crystallize.

THE tartaric acid in several instances is capable of entering into combination at the same time with two bases. In the present example, the superabundant acid of the supertartrate of potash is neutralized with soda, and in place of a mixture of tartrate of potash and tartrate of soda, each possessing their own properties, there results a triple salt, having peculiar properties.

The tartrate of potash and soda forms large and very regular crystals, in the form of prisms with eight sides nearly equal, which are often divided longitudinally, almost through their axis. It has a bitter taste. It is soluble in about five parts of water, and effloresces in the air. It is decomposed by the strong acids, which combine with the soda, and separate super-tartrate of potash, and by baryta and lime. By heat its acid is destroyed. It consists of 54 tartrate of potash, and 46 tartrate of soda.

Medical use.—It was introduced into medical practice by M. Seignette, an apothecary at Rochelle, whose name it long bore. It is still frequently employed; and though less agreeable than the phosphate of soda, it is much more so than the sulphate of soda. It is less purgative than these, and must be given in larger doses.

AQUA AMMONIÆ; olim, **AQUA AMMONIÆ CAUSTICÆ**. *Ed.*
Water of Ammonia, formerly, Water of Caustic Ammonia.

Take of

Muriate of ammonia, one pound;
 Quicklime, fresh burnt, one pound and an half;
 Distilled water, one pound;
 Water, nine ounces.

Pour the water on the powdered lime, contained in an iron or earthen vessel, which is then to be covered up until the lime falls to powder. Then mix the muriate, previously ground into very fine powder, thoroughly with the lime, by triturating them together in a mortar, and immediately put the mixture into a retort of bottle glass. Put the retort in a sand bath, and connect with it a Woulfe's apparatus. In the first and smallest bottle, furnished with a tube of safety, put two ounces of the distilled water, and in the second the rest of the distilled water.

The fire is now to be kindled, and gradually increased, until the bottom of the sand pot becomes red. Mix the fluid contained in each of the bottles, and preserve it in small phials, accurately closed.

LIQUOR ALKALI VOLATILIS CAUSTICI. *Dub.*
Liquor of Caustic Volatile Alkali.

Take of

Sal ammonia, sixteen ounces;
 Quicklime, fresh burnt, two pounds;
 Water, six pounds.

Sprinkle one pound of boiling water upon the lime, placed in a stoneware vessel, and cover up the vessel. Twenty-four hours afterwards, mix the salt with the lime, which will have crumbled to powder, taking care to avoid the vapours. Then put the mixture into a retort, and pour upon it five pounds of water. Having previously agitated them, draw off with a moderate heat twenty ounces of liquor into a refrigerated receiver, having luted carefully the joining of the vessels.

The specific gravity of this liquor is to that of distilled water, as 936 to 1000.

AQUA AMMONIÆ PURÆ. *Lond.**Water of Pure Ammonia.*

Take of

Sal ammoniac, one pound;

Quicklime, two pounds;

Water, one gallon.

Add to the lime two pints of the water. Let them stand together an hour; then add the sal ammoniac and the other six pints of water boiling, and immediately cover the vessel. Pour out the liquor when cold, and distil off with a slow fire one pound.

IN this process the muriate of ammonia is decomposed by the lime, in consequence of its having a stronger affinity for muriatic acid than ammonia has. It is absolutely necessary that the lime employed be very recently burnt, as the presence of carbonic acid would render the ammonia partially carbonated. This accident is also prevented by the great excess of lime used, which having a greater affinity for carbonic acid than ammonia has, retains any small quantity of it which may be accidentally present. The lime is also to be flaked before it be added to the muriate of ammonia, because the heat produced during its flaking would cause a violent disengagement of ammonia gas, and be attended with great loss. The water is essential to the existence of the ammonia in a liquid form, for in itself it is a permanently elastic fluid. In the process adopted by the London and Dublin colleges, a much greater quantity of water, however, is used than what is sufficient to absorb all the ammonia: the rest is intended to render the decomposition slower and more manageable, and to keep the muriate of lime which remains in the retort in solution; for otherwise it would concrete into a solid mass, adhering strongly to the bottom of the retort, very difficult to be washed out, and often endangering its breaking. As soon as the flaked lime and muriate of ammonia are mixed, they should be put into the retort, the water poured upon them, and the distillation begun: for, by the London process of adding the water boiling hot to the mixture, and letting it stand to cool before it is introduced into the retort, there is a very great loss of ammonia, and for no reason whatever. A very small degree of heat is sufficient for the distillation, and the whole ammonia rises with the first portion of water, or even before it. It is therefore necessary that the vessels be very closely luted to each other, to prevent it from escaping. But this renders the utmost care necessary in the distillation; for too sudden, or too great a heat, from the rapid disengagement of gas, or even the expansion of the air contained in the vessels, would endanger their bursting.

In the process directed in the last impression of the Edinburgh Pharmacopœia, this danger is completely obviated, by disengaging the ammonia in the form of gas, and combining it with the water by means of pressure in a pneumatic apparatus. By this process the water should be saturated with ammonia; but of this strength it is never sold out of the shops, unless particularly inquired for, as for common sale it is always diluted with a certain proportion of water.

We have already mentioned the properties of ammonia in its gaseous form, and its relation to the alkalis. When combined with water, it imparts to it many of these properties, and lessens its specific gravity. Liquid ammonia, or water saturated with ammonia, contains 74.63 water, and 25.37 ammonia; and its specific gravity is 0.9054. When it has the specific gravity mentioned by the Dublin college 0.936, it contains about 83 of water, and 17 of ammonia. It assumes its elastic form, and separates from the water, when heated to about 130° , and quickly attracts carbonic acid from the atmosphere. It decomposes many of the earthy, and all the metalline salts, and is capable of dissolving or combining with many of the metalline oxides, and even of oxidizing some of the metals. When pure, water of ammonia does not effervesce with any of the acids, or form a precipitate with alcohol. As it readily absorbs carbonic acid from the atmosphere, the Edinburgh college very properly order it to be kept in small phials. By neglecting this precaution in the shops, it is often perfectly carbonated before the large bottles, in which it is commonly kept, be half done.

Medical use.—Water of ammonia is very rarely given internally, although it may be used in doses of ten to twenty drops, largely diluted, as a powerful stimulant in asphyxia, and similar diseases. Externally it is applied to the skin as a rubefacient, and in the form of gas to the nostrils, and to the eyes as a stimulant; in cases of torpor, paralysis, rheumatism, syncope, hysteria, and chronic ophthalmia.

Off. prep.—Hydrofulph. ammon. *Ed.* Oleum ammon. *Ed. Lond.* Linim camph. comp. *Lond.* Spt. ammon. succinat. *Lond.*

ALCOHOL AMMONIATUM, olim, SPIRITUS AMMONIÆ.
Edin.

Ammoniated Alcohol, formerly, Spirit of Ammonia.

Take of

Alcohol, thirty-two ounces;
Quick-lime, recently burnt, twelve ounces;
Muriate of ammonia, eight ounces;
Water, eight ounces.

From these ingredients Ammoniated Alcohol is prepared, exactly in the same manner as the water of ammonia.

SPIRITUS AMMONIÆ. *Lond.* SPIRITUS ALKALI VOLATILIS. *Dub.*
Spirit of Ammonia. *Spirit of Volatile Alkali.*

Take of

Proof spirit, three pints;
 Sal ammoniac, four ounces;
 Potashes, six ounces.

Mix, and distil with a slow fire, one pint and an half.

WHEN muriate of ammonia is decomposed by carbonate of potash, the product is a mixture of carbonate of ammonia with a variable quantity of ammonia; for the carbonate of potash is never saturated with carbonic acid. Again, as diluted alcohol is employed in this process, and one half only is drawn off, it is evident that there is either a want of economy, or the whole alcohol comes over before any of the water. But if the latter supposition be true, there is also a want of economy, for the alcohol will dissolve only the ammonia, and leave the whole carbonate undissolved. The fact is, that when we perform the process as directed by the London and Dublin colleges, a very large proportion of carbonate of ammonia sublimes, which remains undissolved in the distilled liquor; but as this liquor (after the particles of carbonate of ammonia, which were diffused through it, have separated in the form of very regular crystals, adhering to the sides of the vessel) effervesces with acids, the distilled liquor cannot be pure alcohol, but must contain a proportion of water capable of dissolving some carbonate of ammonia.

But to prove the want of chemical knowledge in the contrivers of this process, it is only necessary to mention that the product is unfit for the preparation of the aromatic ammoniated alcohol, as it will not dissolve the volatile oils.

The process now, for the first time, directed by the Edinburgh college, is, therefore, infinitely preferable, as it is not only more elegant, but more economical, and dissolves the volatile oils perfectly.

The Berlin college direct this preparation to be made by simply mixing two parts of alcohol with one of water of ammonia.

Off. prep.—Alcohol ammon. fœtid. *Ed. Dub.* Alcohol ammon. aromat. *Ed. Lond. Dub.* Tinct. Castor. comp. *Ed.* Tinct. guaiac. amm. *Ed.* Tinct. opii amm. *Ed.*

CARBONAS AMMONIÆ; olim, AMMONIA PRÆPARATA.
Edin.

Carbonate of Ammonia, formerly Prepared Ammonia.

Take of

Muriate of ammonia, one pound;

Pure carbonate of lime, (commonly called chalk), dried, two pounds.

Having triturated them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

AMMONIA PRÆPARATA. *Lond.* ALKALI VOLATILE MITE. *Dub.*
Prepared Ammonia. *Mild Volatile Alkali.*

Take of

Sal ammoniac, powdered, one pound.

Prepared chalk, two pounds.

Mix and sublime. *Lond.*

Dry them with the greatest care: and having mixed them, introduce them into a retort. By means of heat, sublime the alkaline salt, which is to be received in a proper vessel. (*Dub.*)

IN this process the two substances employed undergo a mutual decomposition, the muriatic acid combining with the lime, and the carbonic acid with the ammonia. The proportion of carbonate of lime directed, is perhaps more than sufficient to decompose the muriate of ammonia; but it is the safe side to err on; for it is only sometimes inconvenient, from obliging us to make use of larger vessels, whereas, if any portion of the muriate of ammonia were to remain undecomposed, it would sublime along with the carbonate, and render the product impure. Göttling uses three parts of chalk to two of muriate of ammonia, but he dries his chalk before he weighs it. The chalk is always to be very carefully dried before it is used in this preparation, as the presence of moisture injures the product. The ingredients are to be thoroughly mixed by trituration, before they are introduced into the retort, that no part of the muriate of ammonia may escape decomposition; and we are even sometimes directed to cover the surface of the mixture, after they are in the retort, with powdered chalk. This, however, is unnecessary. Carbonate of lime does not act on muriate of ammonia till a considerable heat be applied. Göttling says, that the sublimation must be conducted in the open fire, and therefore he uses an earthen-ware cucurbit, with a tubulated capital. When a glass retort is employed, it should have a very wide neck; and the best form for the receiver is cylindrical, as

it enables us to get out the carbonate of ammonia condensed in it without breaking it. The residuum which remains in the retort, furnishes muriate of lime by lixiviation and evaporation.

Sometimes carbonate of potash is employed for the preparation of carbonate of ammonia. The theory of the process is the same, and the decomposition is effected at a lower temperature. But as potash is very rarely saturated with carbonic acid, part of the ammonia is evolved in the form of gas, which, if not permitted to escape, will burst the vessels. To prevent this loss, therefore, Mr. Götting uses a cucurbit and capital, furnished with a bent tube, which is to be immersed in a phial of water: by which contrivance, while the carbonate of ammonia is condensed in the capital, the gaseous ammonia is absorbed by the water. When potash is used, the residuum contains muriate of potash.

Carbonate of ammonia is obtained in the form of a white crystallized mass, of a fibrous texture, having the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water, and is more soluble as the temperature of the water increases; but when it approaches to a boiling heat, the carbonate is volatilized. It is insoluble in alcohol. It is permanent in the air, and is not decomposed, but is easily vaporized by heat. It is said to vary very much in its composition, and to contain more ammonia, and less acid and water, in proportion to the high temperature employed in preparing it, the quantity of alkali varying from 50 to 20 *per cent.* It is decomposed by most of the acids, and all the alkaline, and some of the earthy, bases; by the earthy sulphates, except those of baryta and strontia; by the earthy sulphates, muriates, and fluates; by the nitrates of baryta, and superphosphate of lime.

Medical use.—Carbonate of ammonia exactly resembles ammonia in its action on the living body; but is weaker, and is principally used as smelling salts in syncope and hysteria.

Off. prep.—Aqua acetitis ammon. *Ed. Lond. Dub.* Ammonia-retum cupri, *Ed. Lond. Dub.*

AQUA CARBONATIS AMMONIÆ; olim, **AQUA AMMONIÆ**.

Edin. LIQUOR ALKALI VOLATILIS. *Dub.*

Water of Carbonate of Ammonia, formerly, *Water of Ammonia*.
Liquor of Volatile Alkali.

Take of

Muriate of ammonia,

Carbonate of potash, each sixteen ounces;

Water, two pounds.

Having mixed the salts, and put them in a glass retort, pour the water upon them, and distil to dryness in a sand bath, gradually increasing the heat. *Ed.*

Draw off the liquor by distillation, until the residuum become dry. The specific gravity of this liquor is to that of distilled water as 1110 to 1000. *Dub.*

AQUA AMMONIÆ. *Lond.*

Water of Ammonia.

Take of

Sal ammoniac, one pound ;

Potashes, one pound and a half ;

Water, four pints.

Draw off two pints by distillation, with a slow fire.

THE product of this process is a solution of carbonate of ammonia, while the residuum in the retort is muriate of potash. In this instance, the decomposition of the muriate of ammonia cannot be effected by carbonate of lime, because the addition of the water prevents the application of the necessary heat, whereas carbonate of potash acts at a moderate temperature. The directions of the London college differ from those of the other colleges in two particulars ; in the quantity of water added, and in the proportion of carbonate of potash employed. The addition of more water than what is to be drawn off by distillation must increase the size of the apparatus employed, an inconvenience always to be avoided, if possible. With regard to the quantity of carbonate of potash employed, from calculation and the authority of the best writers, for I do not speak from experience, I am disposed to think the London college in the right : for the 42.75 parts of muriatic acid in 100 parts of muriate of ammonia, require 84.12 of potash to saturate them ; but in 100 parts of carbonate of potash, there are not above 50 parts of potash, so that carbonate of potash is not capable of decomposing an equal weight of muriate of ammonia. But it is more economical, as well as more scientific, to prepare this solution by dissolving a certain proportion of carbonate of ammonia in water.

Off. prep.—Oxid. hyd. ciner. *Ed. Dub.* Linim camph. *Dub.*
Pil. ammoniacet cupri, *Ed.*

LIQUOR VOLATILIS, SAL, ET OLEUM, CORNU CERVI.
Lond.

The Volatile Liquor, Salt, and Oil, of Harts-horn.

Take of

Harts-horn, ten pounds.

Distil with a fire gradually increased. A volatile liquor, salt, and oil, will ascend.

The oil and salt being separated, distil the liquor three times.

To the salt add an equal weight of prepared chalk, and sublime thrice, or till it become white.

The same volatile liquor, salt, and oil, may be obtained from any animal substance, except fat.

LIQUOR VOLATILIS CORNU CERVINI. *Dub.*

Volatile Liquor of Harts-horn.

Take of

Harts-horn, any quantity.

Put it into a retort, and distil with a gradually-increased heat, the volatile liquor, salt, and oil. Then repeat the distillation of the volatile liquor until it becomes as limpid as water, separating by filtration the oil and salt after each distillation.

The specific gravity of this liquor is to that of distilled water as 1110 to 1000.

If harts-horn cannot be had, the bones of any other animal may be substituted for them.

THE wholesale dealers have very large pots for this distillation, with earthen heads, almost like those of the common still; for receivers, they use a couple of oil jars, the mouths of which are luted together; the pipe that comes from the head, is connected by means of an adopter with the lower jar, which is also furnished with a cock for drawing off the fluids condensed in it. The upper jar is entire, and in it is condensed the solid carbonate of ammonia. When a large quantity of the subject is to be distilled, it is customary to continue the operation for several days successively; only unluting the head occasionally, to put in fresh materials. When the upper jar becomes entirely filled with carbonate of ammonia, it cracks. It is then to be removed, the salt to be taken out of it, and a fresh one substituted in its place.

When only a small quantity of spirit or salt is wanted, a common iron pot, such as is usually fixed in sand furnaces, may be employed, an iron head being fitted to it. The receiver ought to be large, and a glass, or rather tin, adopter inserted between it and the pipe of the head.

The distilling vessel being charged with pieces of horn, a moderate fire is applied, which is slowly increased, and raised at length almost to the utmost degree. At first water arises, which gradually acquires colour and smell, from the admixture of empyreumatic oil and ammoniacal salts; carbonate of ammonia next arises, which at first dissolves, as it comes over, in the water, and thus forms what is called the *spirit*. When the water is saturated, the remainder of the salt concretes in a solid form to the sides of the recipient. If it be required to have the whole of the salt solid, and undissolved, the water should be removed as soon as the salt

begins to arise, which may be known by the appearance of white fumes; and that this may be done the more commodiously, the receiver should be left unluted, till this first part of the process be finished. The white vapours which now arise, sometimes come over with such vehemence as to throw off or burst the receiver; to prevent this accident, it is convenient to have a small hole in the luting, which may be occasionally stoppt with a wooden peg, or opened, as the operator shall find proper. Lastly, the oil arises, which acquires greater colour and consistency as the operation advances. Carbonate of ammonia still comes over, but it is partly dissolved in the hot oily vapour. At the same time, there is a considerable disengagement of gas, consisting of a mixture of carburetted hydrogen, often containing sulphur and phosphorus, and of carbonic acid.

All the liquid matters being poured out of the receiver, the salt which remains adhering to its sides, is to be washed out with a little water, and added to the rest. It is convenient to let the whole stand for a few hours, that the oil may the better disengage itself from the liquor, so as to be first separated by a funnel, and afterwards more perfectly by filtration through wet paper.

None of these products, except perhaps a small quantity of the latter, exist ready formed in the matter subjected to the distillation, but are produced by a new arrangement of its constituents. For the production of ammonia, it is absolutely necessary that it contain nitrogen, or be what we have called a quaternary oxide. Although some vegetable, and most animal substances, are of this kind, yet only the most solid parts of animals, such as bone and horn, are employed for the production of ammonia; because they furnish it less mixed with other substances, are easily obtained, and at little expence, and are very manageable in the distillation. On the application of heat, as soon as all the water which they contained is expelled, their elements begin to act on each other, and to form binary, or at most ternary compounds. Water is formed of part of the oxygen and hydrogen, ammonia of nitrogen and hydrogen, carbonic acid of carbon and oxygen, then oil of hydrogen and carbon, while the superfluous carbon remains in the retort in the state of charcoal. As the formation of these substances is simultaneous, or in immediate succession, they are not obtained separately, but are mixed with each other. The water is saturated with carbonate of ammonia, and impregnated with empyreumatic oil, while the carbonate of ammonia is discoloured with oil; and the oil contains carbonate of ammonia dissolved in it. They may, however, be separated from each other in a great measure, in the manner already described. But a small portion of oil obstinately adheres both to the salt and its solution, which constitutes the only difference between salt and spirit of harts-

horn, as they are called, and the purer carbonate of ammonia, as obtained by the decomposition of muriate of ammonia.

AQUA ACETITIS AMMONIÆ; vulgo, **SPIRITUS MINDERI.**

Ed. **AQUA AMMONIÆ ACETATÆ.** *Lond.* **LIQUOR ALKALI VOLATILIS ACETATI.** *Dub.*

Water of Acetite of Ammonia, commonly called *Spirit of Mindererus*. *Water of Acetated Ammonia.* *Liquor of Acetated Volatile Alkali.*

Take of

Carbonate of ammonia in powder, any quantity, *Ed.* (two ounces, *Lond. Dub.*)

Pour upon it as much distilled acetous acid as may be sufficient to saturate the ammonia exactly, *Ed.* (About four pints, *Lond.* Three pounds and a half, *Dub.*)

By this process we obtain acetate of ammonia, dissolved in the water of the acetic acid: but as this is apt to vary in quantity, the solution also varies in strength, and the crystallization of the salt is attended with too much difficulty to be practised for pharmaceutical purposes. Its crystals are long, slender, and flattened, of a pearly white colour, and of a cool sweetish taste, are very deliquescent, melt at 170° , and sublime at 250° . It is decomposed by the acids, alkalies, and several of the earths, and metalline salts; and when in solution, its acid is decomposed spontaneously, and by heat.

Different proposals have been made to get a solution of greater strength and uniformity, than that still retained by the British colleges. Mr. Lowe saturates four ounces of carbonate of potash with distilled vinegar, and evaporates the solution to 36 ounces. He then mixes it with two ounces of muriate of ammonia, and distills the mixture in a glass retort. Acetate of ammonia comes over. The last edition of the Prussian Pharmacopœia prepares it by saturating three ounces of carbonate of ammonia with a strong acetic acid, (obtained by distillation from acetate of soda, dissolved in two parts of water, and decomposed by sulphuric acid), and diluting the solution with water, so that it shall weigh twenty-four ounces. One ounce, therefore, contains the alkali of a drachm of carbonate of ammonia.

Medical use.—Acetate of ammonia, when assisted by a warm regimen, proves an excellent and powerful sudorific; and as it operates without quickening the circulation or increasing the heat of the body, it is admissible in febrile and inflammatory diseases, in which the use of stimulating sudorifics are attended with danger. Its action may likewise be determined to the kidneys, by

walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention.

HYDRO-SULPHURETUM AMMONIÆ. *Ed.*

Hydro-Sulphuret of Ammonia.

Take of

Water of ammonia, four ounces ;

Subject it in a chemical apparatus to a stream of the gas, which arises from

Sulphuret of iron, four ounces,

Muriatic acid, eight ounces, previously diluted with two pounds and a half of water.

SULPHURET OF IRON is conveniently prepared for this purpose from

Purified filings of iron, three parts ;

Sublimed sulphur, one part.

Mixed and exposed to a moderate degree of heat in a covered crucible, until they unite into a mass.

SULPHURETTED hydrogen is capable of combining with different bases in the manner of an acid. In the present preparation, it is combined with ammonia. It is obtained by decomposing sulphuret of iron with muriatic acid. As soon as the acid, by its superior affinity, separates the iron from the sulphur, the latter immediately re-acts on the water, the oxygen of which forms with one portion of it sulphuric acid, while the hydrogen dissolves another portion, and forms sulphuretted hydrogen gas. The combination of this with ammonia is facilitated by reduction of temperature, and by making it pass through a column of the water of ammonia, by means of an apparatus, such as Woulfe's, or Nouth's. Trommsdorff has proposed, that the sulphuretted hydrogen gas should be obtained by the decomposition of sulphuret of potash; but in this way its formation is too rapid to be easily managed. Götting says, that the acid should be added gradually, and that the whole must be constantly agitated. But these precautions are rendered more unnecessary, by diluting the acid in the degree directed by the pharmacopœia. Mr. Cruickshank, who first suggested the use of hydro-sulphuret of ammonia in medicine, directs the sulphuret of iron to be prepared by heating a bar of iron to a white heat in a smith's forge, and rubbing against the end of it a roll of sulphur. The iron at this temperature immediately combines with the sulphur, and forms globules of sulphuretted iron, which should be received in a vessel filled with water. It is, however, more conveniently obtained in the manner directed.

ed by the college. Proust has proved that iron is capable of combining with two proportions of sulphur. At a high temperature 100 parts of iron combine with 60 of sulphur, and form a compound of a dull blackish colour. In this state it is fit for the production of sulphuretted hydrogen gas. At a lower temperature the same quantity of iron takes up 90 of sulphur, acquires a greenish yellow colour, and in every respect resembles native pyrites. This cannot be decomposed by acids, and is therefore unfit for the production of gas; but it may be reduced to the state of iron sulphuretted to the minimum, by exposing it to a sufficiently-high temperature, or by melting it with half its weight of iron filings. It was probably from not attending to the different states of sulphuretted iron, that some of the German chemists failed in their attempts to procure from it sulphuretted hydrogen gas, and had recourse to sulphuret of potash. As the proportions have been mis-stated in an elementary work of great authority, it may be proper to recapitulate them:

SULPHURETTED IRON.				SUPER-SULPHURETTED IRON.			
Iron,	100	or	62.5	100	or	52.63	
Sulphur,	60		37.5	90		47.37	
	<hr/>		<hr/>	<hr/>		<hr/>	
	160		100	190		100	

Medical use.—Hydro-sulphuret of ammonia, or more correctly, sulphuretted hydroguret of ammonia, acts powerfully on the living system. It induces vertigo, drowsiness, nausea, and vomiting, and lessens the action of the heart and arteries. It therefore seems to be a direct sedative. According to the doctrine of the chemical physiologists, it is a powerful disoxygenizing remedy. It has only been used in diabetes by Dr. Rollo and others, under the name of Hepatized ammonia, in doses of five or ten drops twice or thrice a-day.

CHAP. IV.

*EARTHS, AND EARTHY SALTS,*MURIAS BARYTÆ. *Edin.**Muriate of Baryta.*

Take of

Carb oate of baryta,
 Muriatic acid, one part;
 Water, three parts.

Add the carbonate, broken into little bits, to the water and acid, previously mixed. After the effervescence has ceased, digest for an hour, strain the liquor, and set it aside to crystallize. Repeat the evaporation as long as any crystals are formed.

If the carbonate of baryta cannot be procured, the muriate may be prepared in the following manner from the sulphate,

Take of

Sulphate of baryta, two pounds;
 Charcoal of wood, in powder, four ounces.

Roast the sulphate with fire, that it may be more easily reduced to a very fine powder, with which the charcoal is to be intimately mixed. Put the mixture into a crucible, and having fitted it with a cover, heat it with a strong fire for six hours. Then triturate the matter well, and throw it into six pounds of water in an earthen or glass vessel, and mix them by agitation, preventing as much as possible the action of the air.

Let the vessel stand in a vapour bath until the part not dissolved shall subside, then pour off the liquor. On the undissolved part pour four pounds more of boiling water, which, after agitation and deposition, are to be added to the former liquor. Into the liquor, when still warm, or if it shall have cooled, again heated, drop muriatic acid as long as it excites any effervescence. Then strain it and evaporate it so as to crystallize.

In the materia medica of the Edinburgh college, the carbonate of baryta is introduced, for the purpose of forming the muriate; but as that mineral is not very common, and sometimes not to be procured, it became necessary to describe the manner of preparing the muriate from the sulphate. This is, however, attended with

very considerable difficulties, on account of the very strong attraction which subsists between the sulphuric acid and baryta.

The sulphate of baryta may be decomposed,

1. By compound affinity, by means of carbonate of potash or muriate of lime.

Carbonate of potash is capable of effecting this decomposition, either in the dry or humid way. Klaproth boils sixteen ounces of finely-powdered sulphate of baryta with 32 ounces of purified carbonate of potash, and five pounds of water, for an hour in a tin kettle, constantly agitating the mixture, and renewing the water as it evaporates. He then allows it to settle, pours off the fluid, which is a solution of sulphate of potash, and edulcorates the precipitate with plenty of water. He next dissolves the carbonate of baryta, which it contains, in muriatic acid. The portion of sulphate which is not decomposed, may be treated again in the same manner.

On the other hand, Van Mons mixes equal parts of sulphate of baryta and carbonate of potash with one fourth of their weight of charcoal all in powder, and heats the mixture to redness in a crucible. When it cools he washes out the sulphate and sulphuret of potash with water, then boils the residuum with a little potash, and washes it again. The carbonate of baryta thus obtained, he dissolves in muriatic acid.

But by these methods of decomposing the sulphate of baryta, we do not get rid of the metallic substances which it often contains, and render the muriate thus prepared unfit for medical use. But the metalline muriates may be expelled, according to Westrumb, by heating the salt to redness as long as any fumes arise. The pure muriate of baryta is then to be dissolved in water and crystallized. Götting, with the same intention, of getting rid of metalline substances, chooses sulphate of baryta, perfectly colourless, and treats it with muriatic or nitro-muriatic acid before he proceeds to decompose it.

La Grange has proposed a new method of decomposing the sulphate of baryta, by means of muriate of lime, which he prepares from the residuum of the decomposition of muriate of ammonia by lime, by dissolving it in a small quantity of hot water, and evaporating it to dryness. He mixes equal parts of this muriate with sulphate of baryta in powder, and projects it by spoonfuls into a crucible previously heated to redness. When it is all in complete fusion, he pours it out upon a polished stone previously heated. The matter, which cracks as it cools, has a whitish grey colour, is very hard, sonorous, and deliquescent, is now to be boiled in about six times its weight of distilled water,

its solution filtered, and the residuum boiled in a smaller quantity of water. The mixed solutions are then evaporated to a pellicle, and on cooling furnish beautiful crystals of muriate of baryta, which are to be washed with cold water, and purified by a second solution and crystallization. The mother water of the first crystallization still contains muriate of baryta, which may be separated from the muriate of lime, with which it is mixed, by repeated solutions and crystallizations. La Grange thinks that this process not only saves time, fuel, and muriatic acid, but that it furnishes a purer muriate of baryta than the following process.

2. By decomposing its acid, by means of charcoal.

The acid of the sulphate of baryta is decomposed at a very high temperature by charcoal. At such a temperature charcoal has a greater affinity for oxygen than sulphur has; it therefore decomposes sulphuric acid, by depriving it of its oxygen, and flies off in the state of carbonic oxid' or acid gas, while the sulphur combines with the baryta. On adding water to the sulphuret thus formed, new combinations take place. A portion of sulphate of baryta is regenerated, while hydroguretted sulphuret, and sulphuretted hydroguret of baryta remain in solution. This solution is exceedingly prone to decomposition, and must therefore be preserved from the action of the air as much as possible. It also crystallizes by cooling, and therefore should be kept at a boiling heat. On the addition of muriatic acid, there is a violent effervescence and disengagement of sulphuretted hydrogen gas, which must be avoided as much as possible, by performing the operation under a chimney, while very pure muriate of baryta remains in solution. When prepared in this way, it cannot be contaminated with any of the noxious metals, as their compounds with sulphur and hydrogen are not soluble. On this account, therefore, it is the process adopted by the Edinburgh college.

Muriate of baryta commonly crystallizes in tables. It has a disagreeable bitter taste; is soluble in five parts of water at 60° , and in less boiling water. It is scarcely soluble in alcohol; and its solution burns with a yellow flame. It crystallizes by evaporation: its crystals are permanent; and by the action of heat decrepitate, dry, and melt. When crystallized it contains 20 acid, 64 baryta, and 16 water; when dried, 23.8 acid, and 76.2 baryta. It is decomposed by the sulphates, nitrates, and sulphites; and by the alkaline phosphates, borates, and carbonates. When pure it has no colour; does not deliquesce; does not burn with a red or purple flame when dissolved in alcohol; and is not precipitated by gallic acid, prussiate of potash and iron, or hydro-sulphuret of ammonia. By washing with alcohol muriate of baryta ren-

dered impure by the presence of muriate of iron, the latter alone is dissolved.

It is commonly given in solution.

SOLUTIO MURIATIS BARYTÆ. *Edin.*

Solution of Muriate of Baryta.

Take of

Muriate of baryta, one part ;

Distilled water, three parts. Dissolve.

THE proportion of water directed here for the solution of muriate of baryta, is considerably less than what is stated to be necessary by the writers on chemistry. It is however sufficient, even at the lowest ordinary temperatures ; a circumstance which should be attended to in making saturated solutions of saline bodies.

Medical use.—Muriate of baryta is generally said by writers on the materia medica to be a *stimulant* deobstruent ; and yet Hufeland, one of its greatest supporters, says, that it succeeds better in cases attended with inflammation and increased irritability than with atony and torpor. When given in large doses, it certainly produces nausea, vomiting, diarrhœa, vertigo, and death.

Its effects on a morbid state of the body are also disputed. Some assert that it is of advantage in no disease ; while others bestow upon it the most unqualified praises. By the latter, it is principally celebrated,

1. In all cases of scrofula.
2. In obstructions and tumors.
3. In cases of worms.
4. In cutaneous diseases.

The dose of the solution at first, is five or ten drops twice or thrice a-day, to be gradually and cautiously increased to as much as the patient can bear.

The solution is also used externally as a stimulating and gently-escharotic application in cutaneous diseases, fungous ulcers, and specks upon the cornea.

AQUA CALCIS. *Edin.*

Lime Water.

Take of

Fresh-burnt lime, half a pound ;

Put it into an earthen vessel, and gradually sprinkle on it four ounces of water, keeping the vessel shut, while the lime grows hot, and falls into powder. Then pour on it twelve pounds of water, and mix the lime thoroughly with the water by agita-

tion. After the lime has subsided, repeat the agitation; and let this be done about ten times, always keeping the vessel shut, that the free access of the air may be prevented. Lastly, let the water be filtered through paper, placed in a funnel, with glass rods interposed between them, that the water may pass as quickly as possible. It must be kept in very close bottles.

Lond.

Take of

Quicklime, half a pound;

Boiling distilled water, twelve pints.

Mix and set them aside in a covered vessel for an hour; then pour off the liquor, which is to be kept in a close-stopt vessel.

Dub.

Take of

Lime recently burnt;

Boiling water, each one pound.

Put the lime into an earthen vessel, and sprinkle the water upon it, keeping the vessel shut while the lime grows warm and falls into powder; then pour upon it twelve pounds of water, and shut the vessel, agitating it frequently for twenty-four hours; lastly, filter the water through paper, placed in a covered funnel, and keep it in well-closed bottles.

WE have already had occasion to speak of the properties of lime, and shall therefore now confine our remarks to the solution of it in water, commonly called Lime-water. In making this, we should first add only so much water as is sufficient to slake the lime, which reduces it to a fine powder, easily diffused through water; for if we add more water at first, it forms a paste with the external part of the lime, and defends the internal from the action of the water. During the whole process, the air must be excluded as much as possible; as lime has a very strong affinity for carbonic acid, and attracts it from the atmosphere. The proportion of water used is scarcely able to dissolve one tenth of the lime; but lime is of little value; and our object is to form a saturated solution quickly and easily. Lime is not more soluble in hot water than in cold; therefore it is unnecessary to use boiling water. The London college decant their solution from the undissolved lime; but in this way we are not so sure of a perfectly-transparent solution as by filtration; and if we use the precautions directed by the other colleges, it may be performed without the lime absorbing a perceptible quantity of carbonic acid. The bottles in which lime-water is kept, should be perfectly full, and well corked.

Lime-water is transparent and colourless. It has an austere

acid taste, and affects vegetable colours as the alkalies do. It enters very readily into combination with all the acids, sulphur, and phosphorus; and decomposes the alkaline carbonates, phosphates, fluates, borates, oxalates, tartrates, and citrates.

Medical use.—When applied to the living fibre, lime-water corrugates and shortens it; it therefore possesses astringent powers. It is also a powerful antacid, or at least it combines with and neutralizes acids when it comes in contact with them. It also dissolves mucus, and kills intestinal worms. From possessing these properties, it is used in medicine, in diseases supposed to arise from laxity and debility of the solids, as diarrhœa, diabetes, leucorrhœa, scrofula, and scurvy; in affections of the stomach accompanied with acidity and flatulence; when the intestines are loaded with mucus; and in worms. Lime-water is scarcely capable of dissolving, even out of the body, any of the substances of which urinary calculi consist; it has therefore no pretensions to the character of a lithontriptic. It has been also recommended in crusta lactea, in cancer, and in chronic cutaneous diseases. Externally, it is applied to ill-conditioned ulcers, gangrenous sores; as a wash in tinea capitis and psora; and as an injection in gonorrhœa, fistulas, and ulcers of the bladder.

When taken internally, its taste is said to be best covered by lukewarm milk. Its dose is commonly from two to four ounces, frequently repeated, but when long continued it weakens the organs of digestion.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.* Oleum lini cum calce, *Ed.*

CARBONAS CALCIS PRÆPARATUS; olim, CRETA PRÆPARATA, ET CANCRORUM LAPILLI; vulgo, OCULI CANCRORUM PRÆPARATI. *Edin.*

Prepared Carbonate of Lime; formerly Prepared Chalk, and Crabs Stones, commonly called Crabs Eyes.

CARBONATE of lime, whether the softer variety commonly called Chalk, or the harder variety called Crabs Eyes and Crabs Stones, after having been triturated to powder in an iron mortar, and levigated on a porphyry stone with a little water, is to be put into a large vessel, and water to be poured upon it, which, after agitating the vessel repeatedly, is to be again poured off, while loaded with minute powder. On allowing the water to settle, a subtile powder will subside, which is to be dried.

The coarse powder which the water could not suspend, may be levigated again, and treated in the same manner.

QUORANDUM, AQUA NON SOLUBILIUM, PRÆPARATIO. *Lond.*
The Preparation of some Substances not soluble in Water.

Reduce these substances first in a mortar to powder; and pouring on a little water, levigate them on a hard and polished, but not calcareous, stone, that they may be made as fine as possible. Dry this powder on blotting-paper laid on chalk, and set it in a warm, or at least a dry, place, for some days.

In this manner are to be prepared

Chalk,

Coral,

Crabs claws, first broken into small pieces, and washed with boiling water,

Oyster-shells, first cleaned from impurities,

And also amber, antimony, calamine, tutty, and verdeggris.

CANCROCORUM CHELÆ PRÆPARATÆ. *Dub.*

Prepared Crabs Claws.

Wash the powdered claws in water mixed with about a sixth part of caustic ley, until the adhering saline and animal particles be entirely separated from the earthy particles, which are to be washed by frequently pouring upon them boiling water. With the addition of a little water, they are then to be ground in a stone-ware mortar to powder, which is to be mixed by agitation with a sufficiently large quantity of water. After a short delay, that is, until the coarser particles subside, the liquor is to be poured off. The same process, by repeating the trituration, may be performed several times. Lastly, the very minute powder swimming in the water poured off, is to be collected after it has subsided, and dried upon paper placed on a bibulous stone.

CRETA PRÆPARATA.

Prepared Chalk.

OSTRÆARUM TESTÆ PRÆPARATÆ.

Prepared Oyster-shells.

OVORUM TESTÆ PRÆPARATÆ.

Prepared Egg-shells.

These are all to be prepared in the same way as crabs claws.

THE preparation of these substances merely consists in reducing them to an impalpable powder. The solution of potash is used by the Dublin college to dissolve the animal matter contained in the different shells; which is apt to keep the carbonate of lime too long suspended, and to give it a bad smell if not quickly dried. But these inconveniencies are totally avoided by using chalk, which, as a medicine, is not inferior to the costly coral.

Med. use.—Carbonate of lime is commonly called an Absorbent Earth. It certainly is an antacid; that is, it combines with and neutralizes most acids, while its carbonic acid is expelled in the form of gas. It is therefore exhibited in affections of the sto-

mach accompanied with acidity, especially when at the same time there is a tendency to diarrhoea. The fear of its forming concretions in the bowels, is probably imaginary; for it is not warranted either by theory or experience.

Applied externally, carbonate of lime may be considered as an absorbent in another point of view; for its beneficial action on burns and ulcers, probably arises entirely from its imbibing the moisture or ichorous matter, as a sponge would do, and thus preventing it from acting on the abraded surfaces, and excoriating the neighbouring parts.

Off. prep.—Hydrag. cum creta, *Lond.* Pulv. carb. calcis comp. *Ed. Lond.* Pulv. opiat. *Ed.* Trochisci carb. calcis, *Ed. Lond.*

SOLUTIO MURIATIS CALCIS. *Edin.*

Solution of Muriate of Lime.

Take of

Pure carbonate of lime, that is, white marble, broken into pieces, nine ounces;

Muriatic acid, sixteen ounces;

Water, eight ounces.

Mix the acid with the water, and gradually add the pieces of carbonate of lime. When the effervescence has ceased, digest them for an hour, pour off the liquor, and evaporate it to dryness. Dissolve the residuum in its weight and a half of water, and lastly, filter the solution.

FROM the difficulty of crystallizing this salt, it is directed to be evaporated to the total expulsion of its water of crystallization, as being the surest way of obtaining a solution of uniform strength. With the same view, Dr. Wood directs that the solution should always have a determinate specific gravity.

Its crystals are prisms of six smooth and equal sides, but they are often so aggregated, that they can only be termed acicular. Its taste is pungent, bitter, and disagreeable. When heated, it melts, swells, and loses its water of crystallization, and at a very high temperature a small part of its acid. It is one of the most deliquescent salts known, and is so soluble in water, that that fluid seems capable of dissolving twice its weight, or at least forms with it a viscid liquor; but as it is still capable of attracting moisture from the air, and of emitting caloric when farther diluted, it can scarcely be considered as a true solution. It is soluble in alcohol, and its solution burns with a crimson flame. It is decomposed by the sulphuric, nitric, phosphoric, fluoric, and boracic acids; by baryta, potash, soda, and strontia; by most of the sulphates, sulphites, nitrates, phosphates, fluates, borates, and the alkaline carbonates. Crystallized, it contains 31 acid, 44 lime, and 25 water; dried at a red heat, 42 acid, 50 lime, and 8 water.

Medical use.—It was first proposed as a medicine by Fourcroy, and has been lately extolled in scrofulous and glandular diseases, and cases of debility in general, by several eminent practitioners of our own country, Dr. Beddoes, Dr. R. Pearson, and Dr. Wood. 30 drops of the solution are a sufficient dose for children, and a drachm for adults, repeated twice or thrice a-day. In an overdose it has produced qualms and sickness; and three drachms and a half killed a dog, the stomach of which, upon dissection, had its villous coat bloodshot, and in many parts almost black and converted into a gelatinous slime. The property of this salt, of producing intense cold during its solution, might also be applied to medical use. For this purpose it might be economically prepared, by saturating with muriatic acid the residuum of the distillation of ammonia or of carbonate of ammonia,

PHOSPHAS CALCIS.

CORNU CERVI USTIO. *Lond.* CORNU CERVINUM USTUM. *Düb.*
Phosphate of Lime. Burnt Hartshorn.

Burn pieces of hartshorn till they become perfectly white; then reduce them to a very fine powder.

THE pieces of horn generally employed in this operation, are those left after distillation.

In the burning of hartshorn, a sufficient fire and the free admission of air are necessary. The potter's furnace was formerly directed, for the sake of convenience; but any common furnace or stove will do. Indeed too violent a heat makes their surface undergo a kind of fusion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole less soluble. If the pieces of horn be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to whiteness, still retaining their original form.

According to the analysis of Merat Guillot, hartshorn was found to consist of 27. gelatine, 57.5 phosphate of lime, 1. carbonate of lime, and there was a loss of 14.5, probably water. Now, as the gelatine is destroyed by burning, and the water expelled, the substance which remains is phosphate of lime, mixed with less than two *per cent.* of carbonate of lime. The bones of animals have lately been discovered to contain phosphate of magnesia.

Medical use.—From its white earthy appearance, it was formerly considered as an absorbent earth. But since it has been accurately analyzed, that idea has been laid aside, and its use has been suggested as a remedy in rickets, a disease in which the deficiency of the natural deposition of phosphate of lime in the bones seems to be the essential or at least most striking symptom. M. Bonhomme, therefore, gave it to the extent of half a scruple,

mixed with phosphate of soda, in several cases with apparent success. Whatever objections may be made to his theory, the practice certainly deserves a trial.

Off. prep.—Decoct. cornu cervi, *Lond.* Pulv. opiatuſ, *Lond.* Phosphas ſodæ, *Ed.*

MAGNESIA; olim, MAGNESIA USTA. *Ed.*

Magnesia, formerly *Calcined Magnesia*.

Let carbonate of magnesia, put into a crucible, be kept in a red heat for two hours, then put it up in close-stopt glaſs vessels.

MAGNESIA USTA. *Lond.* *Dub.*

Calcined Magnesia.

Take of

White magnesia, four ounces.

Expoſe it to a ſtrong heat for two hours; and, when cold, ſet it by. Keep it in a glaſs veſſel cloſely ſtopt.

By this proceſs the carbonate of magnesia is freed of its acid and water; and, according to the late Dr. Black's experiment, loſes about $\frac{1}{2}$ of its weight. A kind of opaque foggy vapour is obſerved to eſcape during the calcination, which is nothing elſe than a quantity of fine particles of magnesia, buoyed off along with a ſtream of the diſengaged gas. About the end of the operation, the magnesia exhibits a kind of luminous or phoſphoreſcent property, which may be conſidered as a pretty exact criterion of its being deprived of its acid.

It is to be kept in cloſe veſſels, becauſe it attracts, though ſlowly, the carbonic acid of the atmosphere.

We have already noticed its general chemical properties.

Med. uſe.—It is uſed for the ſame general purpoſes as the carbonate. In certain affections of the ſtomach, accompanied with much flatulence, magnesia is preferable, both becauſe it contains more magnesia in a given bulk, and, being deprived of its acid, it neutralizes the acid of the ſtomach, without any extrication of gas, which is often a troubleſome conſequence when carbonate of magnesia is employed in theſe complaints.

Off. prep.—Trochiſci mag. *Lond.*

CARBONAS MAGNESIÆ; olim, MAGNESIA ALBA. *Ed.*

Carbonate of Magnesia, formerly *Magnesia Alba*.

Take of

Sulphate of magnesia,

Carbonate of potaſh, equal weights.

Diſſolve them ſeparately in double their quantity of warm water, and let the liquors be ſtrained or otherwiſe freed from their

feces : then mix them, and instantly add eight times their quantity of warm water. Let the liquor boil for a little on the fire, stirring it at the same time ; then let it rest till the heat be somewhat diminished ; after which strain it through linen : the carbonate of magnesia will remain upon the cloth, and it is to be washed with pure water till it become altogether void of saline taste.

MAGNESIA ALBA. *Lond. Dub.*

White Magnesia.

Take of

Vitriolated magnesia,

Prepared kali, each two pounds ;

Distilled water, boiling twenty pints.

Dissolve the vitriolated magnesia and prepared kali separately, each in ten pints of water, and filter through paper ; then mix them. Boil the liquor a little while, and strain it whilst hot through linen, (stretched so as to fit it for collecting the magnesia, *Dub.*) upon which will remain the white magnesia ; then wash away, by repeated affusions of distilled water, the vitriolated kali.

In this process there is a mutual decomposition of the two salts employed. The potash unites itself to the sulphuric acid, while the carbonic acid combines with the magnesia. The large quantity of water used is necessary for the solution of the sulphate of potash formed ; and the boiling is indispensably requisite for the expulsion of a portion of carbonic acid, which retains a part of the magnesia in solution ; 100 parts of crystallized carbonate of potash are sufficient for the decomposition of 125 parts of sulphate of magnesia ; and from these quantities about 45 parts of carbonate of magnesia are obtained.

The ablutions should be made with very pure water ; for nicer purposes distilled water may be used, and soft water is in every case necessary. Hard water for this process is peculiarly inadmissible, as the principle in waters, giving the property called *hardness*, is generally a salt of lime, which decomposes the carbonate of magnesia, by compound affinity, giving rise to carbonate of lime, while the magnesia unites itself to the acid of the calcareous salt, by which the quantity of the carbonate is not only lessened, but is rendered impure by the admixture of carbonate of lime. Another source of impurity is the silica, which the subcarbonate of potash generally contains. It is most easily got rid of by exposing the alkaline solution to the air for several days before it is used. In proportion as it becomes saturated with carbonic acid, the silica is precipitated, and may be separated by filtration.

In the preparation of the carbonate of magnesia, the Berlin

college order carbonate of soda to be used, which has the advantage of forming with the sulphuric acid of the sulphate of magnesia, a much more soluble salt than the sulphate of potash. But the carbonate of magnesia of commerce is prepared from the muriate of magnesia, which remains in solution after the crystallization of muriate of soda from sea-water.

The carbonate of magnesia thus prepared is a very light, white, opaque substance, without smell or taste, effervescing with acids. It is not, however, saturated with carbonic acid. By decomposing sulphate of magnesia by an alkaline carbonate, without the application of heat, carbonate of magnesia is gradually deposited in transparent, brilliant, hexagonal crystals, terminated by an oblique hexagonal plane, and soluble in about 480 times its weight of water. The crystallized carbonate of magnesia consists of 50 acid, 25 magnesia, and 25 water; the sub-carbonate consists of 48 acid, 40 magnesia, and 12 water; and the carbonate of commerce of 34 acid, 45 magnesia, and 21 water. It is decomposed by all the acids, potash, soda, baryta, lime, and strontia, the sulphate, phosphate, nitrate, and muriate of alumina, and the superphosphate of lime.

Medical use.—Carbonate of magnesia is principally given to correct acidity of the stomach, and in these cases to act as a purgative; for solutions of magnesia in all acids are bitter and purgative; while those of the other earths are more or less austere and astringent. A large dose of magnesia, if the stomach contain no acid to dissolve it, neither purges nor produces any sensible effect: a moderate one, if an acid be lodged there, or if acid liquors be taken after it, procures several stools; whereas the common absorbents, in the same circumstances, instead of loosening, bind the belly. When the carbonate of magnesia meets with an acid in the stomach, there is extricated a considerable quantity of carbonic acid gas, which sometimes causes uneasy distention of the stomach, and the symptoms of flatulence. In such cases, therefore, magnesia is preferable to its carbonate; but on other occasions, as in nausea and vomiting, good effects arise from the action of the gas evolved.

Off. prep.—Magnesia, *Ed. Lond. Dub.*

ALUMINIS PURIFICATIO. *Lond.*

Purification of Alum.

Take of

Alum, one pound;

Chalk, one drachm;

Distilled water, one pint.

Boil them a little, strain, and set the liquor aside to crystallize.

THIS process is scarcely necessary ; for the alum of commerce is sufficiently pure for every purpose ; and we apprehend that the addition of the chalk is unchemical, as its only effect will be to decompose part of the alum, without contributing to the purity of the rest.

SULPHAS ALUMINÆ EXSICCATUS ; olim, ALUMEN
USTUM. *Edin.*

Dried Sulphate of Alumina, formerly Burnt Alum.

Melt alum in an earthen or iron vessel, and keep it over the fire until it cease to boil.

ALUMEN USTUM. *Lond. Dub.*
Burnt Alum.

Take of

Alum, half a pound. (Any quantity, *Dub.*)

Burn it in an earthen vessel as long as it boils.

Mr. CHAPTAL found that by exsiccation in a red heat, alum of his own manufacture lost 0.67 ; Roman alum 0.50 ; English alum 0.47, and Levant alum only 0.40. These differences arise principally from different proportions of water of crystallization, but also from an excess of alumina, which the last contains.

According to Kirwan, crystallized alum consists of 17.66 acid, 12. alumina, and 70.24 water, and alum desiccated at 700° of 36.25 acid, and 63.75 basis, by which it would appear that at that heat it loses not only all its water, but also more than half its acid.

Dried alum is only applied externally as a gentle escharotic to fungous ulcers.

CHAP. V.

METALLINE PREPARATIONS,

ANTIMONY.

SULPHURETUM ANTIMONII PRÆPARATUM ; olim,
ANTIMONIUM PRÆPARATUM. *Edin.* ANTIMONIUM PRÆPARATUM. *Lond.*

Prepared Sulphuret of Antimony, formerly Prepared Antimony.

Sulphuret of antimony is prepared in the same way as carbonate of lime.

STIBIUM PRÆPARATUM. *Dub.*
Prepared Antimony.

It is reduced to powder, and the impalpable particles, which are to be kept for use, are procured in the manner directed for the preparation of crabs claws.

By reducing the sulphuret of antimony to the state of an impalpable powder, it is both rendered much more active than it would otherwise be, and it is prevented from irritating the stomach mechanically, of which there would be some danger from the sharpness of its spiculæ. Even in this state, however, it is not a very certain remedy. In general, it operates as a very mild sudorific or cathartic; but sometimes, if it meet with much acid in the stomach, it becomes more active, producing vomiting or hypercatharsis. Therefore, it seems prudent to evacuate the primæ viæ before it be exhibited, and to combine it with an absorbent earth.

It is principally given in scrofula, glandular obstructions, cutaneous diseases and rheumatism. Its dose is from 10 to 30 grains and upwards; and it is best exhibited in the form of a powder or bolus.

OXIDUM ANTIMONII CUM SULPHURE, PER NITRATUM POTASSÆ; olim, CROCUS ANTIMONII. *Edin.*

Oxide of Antimony, with Sulphur, by Nitrate of Potass, formerly Crocus of Antimony.

Take of

Sulphuret of antimony,
 Nitrate of potass, equal weights.

After they are separately powdered and well mixed, let them be injected into a red hot crucible; when the deflagration is over, the reddish matter is to be separated from the whitish crust, and reduced to powder, which is to be edulcorated by repeated washings with hot water, till the water come off insipid.

CROCUS ANTIMONII. *Lond.* STIBIUM NITRO-CALCINATUM. *Dub.*

Crocus of Antimony. Antimony Calcined by Nitre.

Take of

Antimony, powdered,
 Nitre, powdered; of each one pound;
 Sea salt, one ounce.

Mix, and inject them by degrees into a red-hot crucible, and melt

them, having augmented the heat. Pour out the melted matter, and, when cold, separate it from the scorixæ.

IN this process, the nitric acid of the nitre, and part of the sulphuret, are mutually decomposed: the sulphur is acidified, and combines with the potash of the nitre, while the antimony is converted into protoxide, which combines with the undecomposed portion of the sulphuret, and forms a dark brown, opaque, vitrified mass; so that after the scorixæ and other saline matters have been removed by washing, the substance which remains, according to Proust, consists of three parts of oxide of antimony, and one of sulphuret of antimony.

With regard to the mode of preparation, Bergmann observes, that by the common process of throwing the mixture into an ignited uncovered crucible, there is sometimes a loss of nearly one half, and therefore advises the mixture to be put into a cold crucible, which is to be covered and heated till the matter melts, by which means there is very little loss.

What is kept in the shops, is almost universally prepared with less nitre than is here ordered. The consequence is, that too much sulphur remains not acidified, the antimony is scarcely oxidized, and the preparation is unfit for the uses to which it ought to be applied. When nitre has been thus culpably economized, the crocus has a steel grey, instead of a liver brown colour. The addition of common salt, directed by the London and Dublin colleges, is improper, as it is decomposed, and a portion of muriate of antimony is formed.

The sulphuretted oxide of antimony is a very uncertain preparation, often operating with very great violence. Its internal use is therefore almost proscribed, or at least confined to manical cases, and veterinary practice. It is, however, useful in pharmacy, as the basis of other preparations.

OXIDUM ANTIMONII, CUM SULPHURE, VITRIFICATUM; olim VITRUM ANTIMONII. *Ed.*

Vitrified Oxide of Antimony with Sulphur, formerly Glass of Antimony.

Strew sulphuret of antimony beat into a coarse powder like sand, upon a shallow unglazed earthen vessel, and apply a gentle heat underneath, that the antimony may be heated slowly: keeping it at the same time continually stirring, to prevent it from running into lumps. White vapours of a sulphureous smell will arise from it. When they cease with the degree of heat first applied, increase the fire a little, so that vapours may again arise; go on in this manner, till the powder, when brought to

a red heat, exhales no more vapours. Melt this powder in a crucible with an intense heat, till it assumes the appearance of melted glass; then pour it out on a heated brass plate.

ANTIMONIUM VITRIFICATUM. *Lond.*

Vitrified Antimony.

Take of

Powdered antimony, four ounces.

Calcine it in a broad earthen vessel with fire gradually raised, stirring it with an iron rod until it no longer emit smoke. Put this powder into a crucible, so as to fill two thirds of it. A cover being fitted on, make a fire under it, at first moderate, afterwards stronger, until the matter be melted. Pour out the melted glass.

GLASS of antimony, according to Proust, consists of one part of sulphuret of antimony, combined with eight of oxide of antimony; now, by this process, the greatest part of the antimony is deprived of its sulphur, and is at the same time converted into the protoxide, which combines with the small portion of sulphuret which remains undecomposed. But as this preparation is not easily made in the manner here directed, unless in a furnace constructed on purpose, apothecaries may advantageously adopt the synthetical method of Bergmann, which consists in melting in a crucible, with one twelfth or eighth of its weight of sulphur, protoxide of antimony prepared by deflagrating it with more than twice its weight of nitre. At the temperature necessary for melting it, the protoxide of antimony loses great part of its oxygen, and is converted into sulphuret and protoxide, in the proportions which form the glass of antimony. From our present knowledge of the composition of this substance it might be named *oxidum antimonii cum sulphureto*.

In whichever way prepared, the glass of antimony is transparent, and has a fine hyacinthine colour. On dissolving it in muriatic acid, it gives out sulphuretted hydrogen gas. Its medical operation is so uncertain, that it is only used in making other preparations.

OXIDUM ANTIMONII VITRIFICATUM, CUM CERA;
olim, VITRUM ANTIMONII CERATUM. *Ed.*

Vitrified Oxide of Antimony with Wax; formerly, Cerated Glass of Antimony.

Take of

Yellow wax, one part;

Vitrified oxide of antimony, with sulphur, eight parts.

Melt the wax in an iron vessel, and throw into it the powdered

oxide : roast the mixture over a gentle fire for a quarter of an hour, continually stirring it ; then pour it out, and when cold grind it into powder.

THE glass melts in the wax with a very gentle heat : after it has been about twenty minutes on the fire, it begins to change its colour, and in ten more comes near to that of Scottish snuff ; which is a mark of its being sufficiently prepared ; the mixture loses about one ninth of its weight in the process.

This medicine was for some time much esteemed in dysenteries. The dose is from two or three grains to twenty, according to the age and strength of the patient. In its operation, it makes some persons sick, and vomit ; it purges almost every one ; though it has sometimes effected a cure without occasioning any evacuation or sickness. It is now, however, much less used than formerly.

SULPHUR STIBIATUM FUSCUM ; olim, KERMES MINERALIS. Dub.

Brown Antimoniated Sulphur ; formerly, Kermes Mineral.

Take of

Prepared antimony,

Mild vegetable alkali, each one ounce.

Melt them together in a crucible, and when cold reduce the substance to powder. Put this into a matrafs with five pounds of pure water, and boil for an hour. Then remove the vessel from the fire ; let it stand at rest for a little, and as soon as the liquor becomes clear, pour it cautiously from the sediment. When the liquor grows cool, the brown antimoniated sulphur will separate, which is to be dried on paper.

ACCORDING to Thenard, the brown precipitate consists of

72.760 brown oxide of antimony.

20.298 sulphuretted hydrogen.

4.156 sulphur.

2.786 water and loss.

100.

He considers kermes mineral, therefore, as a sulphuretted fulphuret of antimony, especially as it differs from that which is prepared by the direct combination of its constituents, only in containing a small quantity of superabundant sulphur.

When the sulphuret of antimony and carbonate of potash are

melted together, the carbonic acid is expelled with effervescence, and a sulphuret of potash and antimony is formed. On boiling this in water, water is decomposed, the antimony is oxidized, and the hydrogen combines with the sulphur. The sulphuretted hydrogen thus formed, combines partly with the potash, and partly with the oxide of antimony. Now, the sulphuretted hydroguret of antimony, (kermes mineral), is soluble in a solution of sulphuret hydroguretted of potash, at 212° , but not at ordinary temperatures. Therefore, on cooling, it separates and falls to the bottom.

Such is the present theory of the formation of kermes mineral. With regard to the practice, the directions of the Dublin college differ considerably, especially in the proportions of the substances employed, from the best pharmaceutical writers on the Continent. Lemery melted sixteen parts of sulphuret of antimony, and one of sulphur, with eight parts of carbonate of potash. The last edition of the Prussian pharmacopœia directs two parts of sulphuret of antimony, and one of exsiccated carbonate of soda, to be melted, and afterwards boiled fifteen minutes in six or eight parts of water, which on cooling deposits a considerable quantity of kermes. The fluid from which the kermes has been deposited may be again boiled in the residuum of the first decoction, and it will dissolve a fresh portion of kermes; and this process may be repeated as long as there remains any to dissolve. After this, the residuum, when melted, consists almost solely of antimony. It therefore seems, that the alkali renders almost all the sulphur soluble, and only disposes the oxidizement of as much antimony as is capable of combining with the sulphuretted hydrogen. There appears to be no reason why the whole of the antimony should not be converted into kermes by employing a proper addition of sulphur and alkali,

Kermes is also made in the humid way. Fourcroy boils, in twenty parts of water, six parts of pure potash of commerce, and into the boiling solution throws about the twentieth part of the weight of the alkali, or 0.3 of a part of powdered sulphuret of antimony, and continues the boiling for seven or eight minutes, then filters, and allows the kermes to precipitate by cooling. Hermbstadt uses very different proportions; for he boils twelve parts of sulphuret of antimony, and three of salt of tartar, in ninety-six parts of water, down to sixty-four, and then filters, &c. Gren employs four parts of sulphuret of antimony, sixteen of carbonate of potash, and sixty-four of water, and boils for several hours. Götting boils eight parts of sulphuret of antimony, and two of sulphur in a sufficient quantity of solution of potash down to one half.

Medical use.—This preparation of antimony is less used in Britain than on the Continent. It is an active substance, and apt to excite vomiting. To adults, the dose is a grain, or a grain and a half.

SULPHURETUM ANTIMONII PRÆCIPITATUM. *Edin.*

SULPHUR ANT. PRÆCIP. *Lond.* SULPHUR STIBIATUM RUFUM.

Dub.

Precipitated Sulphuret of Antimony. Precipitated Sulphur of Antimony. Orange Antimoniated Sulphur.

Take of

Water of potash, four pounds ;

Water, three pounds ;

Prepared Sulphuret of antimony, two pounds.

Boil them, in a covered iron pot, over a slow fire for three hours, adding more water, if necessary, and frequently stirring the mixture with an iron spatula: strain the liquor while warm through a double cloth, and add to it when filtered

Diluted sulphuric acid as much
as is necessary to precipitate the sulphuret, which must be well washed with warm water.

THIS is also, according to the analysis of Thenard, a sulphuretted hydroguret of antimony, which consists of

68.3 orange oxide of antimony.

17.877 sulphuretted hydrogen.

12. sulphur.

98.177

Thenard considers the sulphur as only mechanically and accidentally mixed ; and that the essential difference between this preparation and kermes mineral consists in the degree of oxidizement of the antimony.

But notwithstanding the great celebrity of Thenard as a chemist, and his having paid particular attention to the combinations of antimony, we may be allowed to doubt the accuracy of his opinion, for it must appear to every one an affected refinement of analysis, to discover in such substances a difference of only 2 per cent. of oxidizement ; and as Proust has since shewn that both preparations contain the protoxide, the only difference between these bodies appears to be the proportion of sulphur they contain. For it is agreeable to analogy to suppose, that the sulphuretted hydroguret of antimony is more soluble in a solution of hydrogu-

retted sulphuret of potash at 212° than at 60° . Therefore, as a boiling solution cools, that portion of the sulphuretted hydroguret of antimony, which it is unable to retain in solution at a reduced temperature, separates and forms the red precipitate, known by the name of kermes mineral; but the portion which remains in solution, can only be obtained by decomposing the hydroguretted sulphuret of potash itself, by means of an acid: and therefore the precipitate forming the sulphur auratum antimonii, is a mixture or compound of hydroguretted sulphuret of antimony, (kermes mineral) with the sulphur of the decomposed sulphuret of potash, which gives it a brighter and paler colour.

The precipitated sulphuret of antimony, like the kermes, may be prepared either in the dry or in the moist way. The latter is the mode adopted by the British colleges, and also seems to be the most universally employed on the Continent. Götting boils two parts of sulphuret of antimony, and three of sulphur, in a sufficient quantity of a recent solution of potash, filters the solution, and precipitates with sulphuric acid, diluted with twelve times its weight of water. The Prussian college use equal parts of sulphuret of antimony and of sulphur. Wiegleb treats in the same manner two parts of sulphuret of antimony with one of sulphur. But to his proportions it has been objected, that the product resembles kermes more than sulphur auratum. If this objection be just, it must apply in a still stronger degree to the formula of the British colleges, in which no sulphur is added.

In the dry way, two parts of sulphuret of antimony and three of sulphur may be melted with five or six of pure carbonate of potash in a covered crucible, as quickly as possible, poured into an iron mortar, reduced to powder, and dissolved by boiling the powder in water. The solution is to be filtered warm, diluted with a sufficient quantity of water, and precipitated by dilute sulphuric acid. By some, the solution is allowed to remain at rest for twenty-four hours before it be filtered, and some precipitate by nitrous acid.

The processes for making the golden sulphuret of antimony, depend on the property which the hydroguretted sulphuret of potash possesses, of dissolving, and retaining dissolved, even at ordinary temperatures, a portion of orange oxide of antimony; and as the attraction by which potash exists in this compound is weaker than its affinity for acids, on the addition of any acid, the potash unites with the acid; a portion of sulphuretted hydrogen gas escapes; and the oxide of antimony, combined with the rest of the sulphur and hydrogen, are precipitated in the form of a light orange powder. When the acid is added gradually, the proportion of oxide of antimony always decreases, while that of the sulphur increases in each successive portion of precipitate. Hence

in the old manner of preparing this substance from the scoriz, formed in reducing antimony from its sulphuret, and which contained but little sulphur, the two first portions of precipitate, being dark coloured, were rejected, and only the product of the third precipitation retained for use. The want of economy in this process is sufficiently obvious, as well as the very great improvement in modern times, of adding a sufficient quantity of sulphur, and precipitating the whole at once.

Medical use.—In its action on the body, the orange sulphuret of antimony coincides with the kermes mineral; but on account of the larger proportion of sulphur, it must be given in somewhat larger doses.

Off. prep.—Pil. stibii comp. *Dub.*

MURIAS ANTIMONII. *Edin.* **ANTIM. MURIATUM.** *Lond.*
STIBIUM MURIATUM CAUSTICUM. *Dub.*

Muriate of Antimony. Muriated Antimony. Caustic Muriated Antimony.

Take of

Oxide of antimony with sulphur, by nitrate of potass,
Sulphuric acid, each one pound;
Dried muriate of soda, two pounds.

Pour the sulphuric acid into a retort, gradually adding the muriate of soda and oxide of antimony previously mixed. Then perform the distillation in a sand-bath. Expose the distilled matter for several days to the air, that it may deliquesce, and then pour the liquid part from the feces.

MURIATE of antimony was originally prepared by distilling sulphuret of antimony with muriate of quicksilver. Muriate of antimony, or butter of antimony, as it was called from its appearance when recently prepared, passes over into the receiver, and black sulphuret of quicksilver remains in the retort, or, by increasing the heat, red sulphuret of mercury, which, when obtained by this process, was formerly termed Cinnabar of antimony, is sublimed. But this mode of preparation is both expensive and dangerous to the health of the operator. To avoid these inconveniencies, Scheele prepared a sulphuretted oxide of antimony, by deflagrating two parts of sulphuret of antimony with three of nitrate of potass in an iron mortar. The mass thus obtained is to be powdered, and one pound of it put into a glass vessel, on which is to be poured first a mixture of three pounds of water and fifteen ounces of sulphuric acid, and afterwards fifteen ounces of powdered common salt. The whole is to be digested for twelve hours, and stirred all the while, and the solution, when cool, strained through linen. On the residuum one third of the above menstruum is to

be poured, and the mixture digested and strained. When diluted with boiling water, a copious precipitate of submuriate of antimony takes place from the decomposition of the muriate, while the other salts contained in the solution are not affected by it. Mr. Stott says, that the digestion need not be continued longer than two or three hours, and that the heat must be kept moderate, as the muriate of antimony begins to evaporate before it boils. This process furnishes an easy, if not the best, mode of preparing the submuriate of antimony, but it does not give us the solution of the muriate in a state of purity. In consequence, however, of its volatility, we may easily separate it from the other salts by distillation. This was first proposed by Gmelin, and improved by Wieg-
 leb, who distilled a mixture of one part of sulphuret of antimony, four of muriate of soda, and three of sulphuric acid diluted with two of water; but in this process, the product is rendered impure by the admixture of sulphur, and there is great danger of the vessels bursting from the immense quantity of sulphuretted hydrogen gas disengaged. In 1781, the process adopted by the British colleges was first introduced in the London Pharmacopœia. The Prussian Dispensatory pours upon two ounces of crocus of antimony, and six of dried muriate of soda, introduced into a retort, four ounces of sulphuric acid previously diluted with two ounces of distilled water, and distill. But we have already observed, that the oxide of antimony made use of in this preparation, is seldom sufficiently oxidized or deprived of its sulphur, which occasions the production of much sulphuretted hydrogen gas, and from the concentrated state in which the materials are employed, the muriatic acid gas is sometimes disengaged, especially if the heat be improperly applied, so rapidly, that it has not time to act upon the oxide of antimony. At last, in 1797, Götting, by substituting the glass of antimony for the crocus, diluting the sulphuric acid, and using the muriate of soda crystallized, removed these inconveniencies. He introduces into a retort a mixture of four ounces of glass of antimony in powder, with sixteen of muriate of soda, and then pours into it twelve ounces of sulphuric acid, diluted with eight of water. He lutes on a tubulated receiver with gypsum, and distils to dryness in a sand-bath, with a heat gradually increased. By this process, he says, about twenty ounces of very strong fuming solution of muriate of antimony are obtained. The residuum in the retort is sulphate of soda, but unfit for internal use, on account of its being mixed with some antimony.

Muriate of antimony is crystallizable. It is remarkably deliquescent, and forms a permanent solution; but if more than a certain proportion of water be added, it is decomposed; a large quantity of submuriate of antimony being precipitated, in the

form of white silky crystals, while a super-muriate remains in solution. Muriate of antimony has been said by Dr. Thomson to contain the peroxide, but besides the well known solubility of the oxide and sub-muriate prepared from it, in tartaric acid, an additional proof that it contains the protoxide occurred to myself in the rapid effervescence of hydrogen gas which takes place when zinc is immersed in it.

CALX STIBII PRÆCIPITATA. *Dub.*

Precipitated Calx of Antimony.

Take of

Mild vegetable alkali,

Caustic muriated antimony, each eight ounces;

Water, forty pounds.

Dissolve the vegetable alkali in the water, and to the filtered liquor add the caustic muriated antimony. Dry the calx which subsides, after washing away the saline matters.

THIS process is intended to separate the protoxide contained in the muriate of antimony, by means of the superior affinity which potash possesses for muriatic acid. It is absolutely necessary that the muriate of antimony be poured into the alkaline solution, and not the solution into the muriate; for the muriate is partially decomposed by water alone, which combines with part of the acid; and the salt, brought to the state of an insoluble submuriate, is precipitated. Therefore, if we pour the alkaline solution into the muriate of antimony, the muriate acts first upon the alkali, and immediately afterwards upon the water of each portion of the solution; and therefore we obtain a mixed precipitate of oxide of antimony and submuriate of antimony. But if we pour the muriate into the alkaline solution, the whole acid of each portion of the muriate immediately finds a sufficient quantity of alkali to saturate it, and the whole, or at least a much larger proportion of the antimony, is precipitated in the state of oxide.

OXIDUM ANTIMONII CUM PHOSPHATE CALCIS;

olim, PULVIS ANTIMONIALIS. Ed. PULVIS ANTIMONIALIS.

Lond. PULVIS STIBIATUS. Dub.

Oxide of Antimony with Phosphate of Lime, Antimonial Powder.

Take of

Sulphuret of antimony, in coarse powder,

Shavings of hartshorn, equal weights.

Mix, and put them into a wide red-hot iron pot, and stir the mixture constantly, until it be burnt into a matter of a grey colour, which is then to be removed from the fire, ground into powder, and put into a coated crucible. Lute to this crucible

another inverted over it, and perforated in the bottom with a small hole, and apply the fire, which is to be raised gradually to a white heat, and kept in that increased state for two hours. Lastly, grind the matter, when cold, into a very fine powder.

THIS is supposed to be nearly the same with the celebrated nostrum of Dr. James, the composition of which was ascertained by Dr. Pearson of London, to whom we are also indebted for the above formula.

By burning sulphuret of antimony and shavings of hartshorn in a white heat, the sulphur is entirely expelled, and the antimony is oxidized, while the gelatine of the hartshorn is destroyed, and nothing is left but phosphate of lime, combined with a little lime. Therefore, the mass which results is a mixture of oxide of antimony and phosphate of lime, which corresponds, at least as to the nature of the ingredients, with James's powder, which, by Dr. Pearson's analysis, was found to consist of 43 phosphate of lime, and 57 oxide of antimony. M. Pully also analysed some James's powder, and found it composed of protoxide of antimony 37, phosphate of lime 21, sulphate of potash 24, and potash combined with protoxide of antimony 18. On which occasion M. Cadet, ignorant that even quack-medicines were often imitated and adulterated, accuses Dr. Pearson of having sanctioned with his name a false analysis, in order to conceal a secret so profitable to his country! Mr. Chenevix, by considering the uncertainty of the application, and the precarious nature of the agency, of fire, by which means a variable portion of the oxide of antimony may be volatilized, and that which remains may be oxidized in various degrees, proposes to prepare a substitute for James's powder, by dissolving together equal weights of submuriate of antimony and of phosphate of lime in the smallest possible quantity of muriatic acid, and then pouring this solution gradually into water sufficiently alkalized with ammonia. For the reason mentioned in the preceding article, it is absolutely necessary that the muriatic solution be poured into the alkaline liquor. By an opposite mode of procedure, the precipitate would contain more antimony at first, and towards the end, the phosphate of lime would be predominant, and the antimony would be partly in the state of a submuriate. The phosphate of lime is most conveniently obtained pure by dissolving calcined bone in muriatic acid, and by precipitating it by ammonia. If the ammonia be quite free from carbonic acid, no muriate of lime is decomposed. Mr. Chenevix also found, that his precipitate is entirely soluble in every acid which can dissolve either phosphate of lime or oxide of antimony separately, and that about 0.28 of James's powder, and at an average 0.44 of the pulvis antimonialis of the London Pharmacopœia resist the action of every acid.

We have here another proof of the utility of pharmaceutic names descriptive of the nature of the substance; for the pulvis stibiatus of Berlin is a mixture of the antimon. calcinat. *Lond.* with twice its weight of sulphate and nitrate of potass.

Med. use.—The oxide of antimony with phosphate of lime, howsoever prepared, is one of the best antimonials we possess. It is given as a diaphoretic in febrile diseases, in doses of from three to eight grains, repeated every third or fourth hour. In larger quantities, it operates as a purgative or emetic. From its being insoluble in water, it must be given either in the form of a powder, or made into a pill or bolus.

TARTRIS ANTIMONII; olim, TARTARUS EMETICUS. *Ed.*
ANTIMONIUM TARTARISATUM. *Lond.*

Tartrite of Antimony; formerly, Tartar Emetic. Tartarized Antimony.

Take of

Oxide of antimony with sulphur, by nitrate of potass, three parts;

Super-tartrite of potass, four parts;

Distilled water, thirty-two parts;

Boil in a glass-vessel for a quarter of an hour, strain through paper, and set aside the strained liquor to crystallize.

TARTARUM STIBIATUM. *Dub.*
Antimoniated Tartar.

Take of

The precipitated calx of antimony, two ounces;

Crystals of tartar, in very minute powder, four ounces;

Distilled water, five pounds.

Boil until the powders be dissolved, and strain the liquor when cold through paper; then having thrown away the salt which remains upon the paper, crystallize by evaporation and slow refrigeration. The crystals should have a regular figure.

THE tartaric acid is capable of combining, in many examples, with two bases at the same time, forming with them triple crystallizable salts. In the present instance, it is combined with oxide of antimony and potass; and as the potass is essential to its constitution, and the real tartrate of antimony is a different salt, its name should certainly have been Tartrate of Antimony and Potass.

In the preparation of this salt, the different combinations of protoxide of antimony have been employed. Any of them will afford a very pure salt. The crocus, precipitated oxide, submuriate, and glass, are all occasionally employed. The London and

Edinburgh colleges use the crocus. To this the principal objection is, that it is never found in the shops in a state fit for this purpose. The Dublin college use the precipitated oxide, which answers extremely well, but is too expensive to be generally adopted. The submuriate, which is more easily prepared, is just as good; for the muriatic acid is completely separated by part of the potass, and remains in the mother water. Mr. Stott thinks muriatic acid essential to the constitution of good tartar emetic, and says, that he could never obtain it in transparent crystals, when he employed the glass or crocus, or any other oxide of antimony than the pulvis algerothi. He therefore concludes, that tartar emetic is a quadruple salt, consisting of oxide of antimony, with muriatic acid, rendered soluble by acid of tartar, combined with an under proportion of potass, and takes the opportunity of remarking, that he has not found a name in the new nomenclature expressive of its constituent parts. Such an assertion is easily made; but I can only say, that I have repeatedly prepared tartar emetic perfectly colourless, and in very large and beautiful crystals, both with the crocus and glass; and that therefore muriatic acid, if ever present, must always be considered as an impurity. The glass is perhaps the least objectionable of any, and is recommended by Götting. It always, however, contains about 0.1 of silica. The quantity of water employed must be sufficient to dissolve the tartar emetic formed. The time during which the ebullition is to be continued, is stated differently by different pharmacutists. No harm can arise from continuing it longer than is absolutely necessary; but it is certainly a waste of time and fuel to protract it for hours. But the circumstance which renders the tartar emetic most variable in its effects, is the mode of crystallization. Some evaporate it to dryness; others to a pellicle, and set it aside to crystallize; and others again crystallize by slow evaporation. On account of the silica which is combined with the oxide of antimony, and which, being held in solution by the potass, impedes the crystallization, and varies the nature of the product, Vauquelin recommends that the solution be first evaporated to dryness, and that the saline mass obtained should be redissolved in boiling water, and then crystallized; for, towards the end of the first evaporation, the silica separates, and becomes totally insoluble. In this way, he says, that we obtain both a purer salt, and in larger quantity. If we employ an excess of super-tartrate of potass, part of it will remain undecomposed, and will crystallize before or along with the tartar emetic. This source of impurity is easily avoided, by using an excess of the antimonial oxide, which remaining undissolved, occasions no error, and prevents the necessity of throwing away, as the Dublin college direct,

the crystals which form on the filtering paper, if the solution be saturated.

The primitive form of the crystals of tartrate of antimony and potash seems to be the regular tetrahedron, but it assumes a variety of secondary forms. It has a styptic metallic taste. It is soluble in three times its weight of water at 212° , and in fifteen at 60° . As this statement of its solubility is very different from that of most writers, from Bergmann to Fourcroy, who say that it requires 80 parts of water at 60° , and somewhat less than 40 of boiling water, it is necessary to mention, that it was ascertained by careful experiment, with very fine crystals of tartar-emetic, more than half an inch in length, and perfectly free from the admixture of any foreign salt. The crystals, by exposure to the air, become white and opaque, but do not readily fall to powder. The property of deliquescing ascribed to them by Götting, must have arisen from the presence of other salts, as he does not prepare his tartar-emetic by crystallization, but by evaporating the solution to dryness. The solution of tartar-emetic slightly reddens tincture of turnsol. It is decomposed by acids, alkalies, alkaline carbonates, sulphuretted hydrogen and its compounds, vegetable juices, decoctions, and infusions, and many of the metals. According to Thenard, it consists of tartrate of antimony 54, tartrate of potash 34, water 8, and loss 4; or, oxide of antimony 38, tartaric acid 34, potash 16, water and loss 12; and by estimation from the analysis of tartrate of potash, and super-tartrate of potash, by the same chemist, it appears, that to saturate 38 parts of protoxide of antimony, 70.4 of super-tartrate of potash are necessary: the whole of the superfluous acid, being 16, combines with the oxide, while 34 of the tartrate of potash combine with the tartrate of antimony thus formed, and 20.4 of tartrate of potash remain in solution in the mother water.

We have been thus particular in our account of the preparation and chemical properties of tartar-emetic, because it is not only of all the preparations of antimony the most certain in its operation, but is almost indispensable for the successful practice of medicine.

Medical use.—In doses of from one to three grains it operates as an emetic, and sometimes as a cathartic. In smaller doses, it excites nausea, and proves a powerful diaphoretic and expectorant. As an emetic it is chiefly given in the beginning of fevers and febrile diseases, in chincough, and, in general, whenever we wish to evacuate the stomach quickly. When great debility is present, and in the advanced stages of typhoid fever, its use is improper, and even sometimes fatal. As a diaphoretic it is given in small doses, of from an eighth to a quarter of a grain; and as an expectorant in doses still smaller.

The only proper form for exhibiting it is in solution; and as the intensity of its action on the body is liable to variation, from differences in its own strength, and in the constitution of the patient, it should almost always be given in divided doses, at short intervals, if we wish to excite vomiting; and at longer intervals, if we only wish it to act on the skin or lungs.

VINUM TARTRITIS ANTIMONII; olim, VINUM ANTIMONIALE. *Ed.*

Wine of Tartrate of Antimony, formerly Antimonial Wine.

Take of

Tartrate of antimony, twenty-four grains;

Spanish white wine, one pound.

Mix them so that the tartrate of antimony may be dissolved.

VINUM TARTARI STIBIATI. *Dub.* VINUM ANT. TARTAR. *Lond.*

Wine of Antimoniated Tartar. Wine of Tartarized Antimony.

Take of

Antimoniated tartar, ten grains; *Dub.* Two scruples, *Lond.*

Distilled water, boiling hot, half an ounce; *Dub.* Two ounces, *Lond.*

Spanish white wine, two ounces; *Dub.* Eight ounces; *Lond.*

Dissolve the antimoniated tartar in the water, and then add the wine.

VINUM ANTIMONII. *Lond.*

Wine of Antimony.

Take of

Vitrified antimony, in powder, one ounce;

Spanish white wine, a pint and a half.

Digest them for twelve days, agitating them frequently, and strain through paper.

ALL these are solutions of tartrate of antimony and potash in wine; for, in the last instance, a portion of the glass of antimony is dissolved by the super-tartrate of potash contained in the wine; and as the quantity of this is variable, so also the quantity of oxide of antimony dissolved varies: and therefore the preparation ought to be entirely rejected, since its strength can never be known. It is also to be regretted, that the strength of the solutions of tartrate-emetic in wine, as prescribed by the different colleges, is not uniform. According to the Edinburgh college, one ounce of the solution contains two grains of tartar-emetic, while the same quantity, according to the other colleges, contains four grains.

In its employments and effects, the vinous solution of tartar-emetic does not differ from one made with water.

ANTIMONIUM CALCINATUM. *Lond.*

Calcined Antimony.

Take of

Antimony, powdered, eight ounces;

Nitre, powdered, two pounds.

Mix them, and project the mixture by degrees into a red hot crucible. Burn the white matter about half an hour; and, when cold, powder it; after which wash it with distilled water.

On touching the ignited crucible, this mixture deflagrates with a lively white flame; the antimony is oxidized to the maximum, the sulphur is acidified, and the nitre is decomposed and reduced to its base. The product of this deflagration is a lemon-coloured, scorified mass, which, after being washed with water, leaves the greater part of the oxide of antimony united to about a fifth of its weight of potash; while the remainder of the oxide, combined with a much larger proportion of potash, is dissolved in the water, along with the sulphate of potash formed, and a small quantity of nitre which has escaped decomposition. The peroxide of antimony obtained by this process contains about 0.30 oxygen, is scarcely acted upon by acids, and is capable of forming, with the alkalies, crystallizable compounds, enjoying a determinate degree of solubility. It may therefore be considered as nearly approaching to the state of an acid; and the insoluble residuum of this process might be named super-antimonite of potash, and the dissolved portion, from its different proportions, antimonite of potash.

The Prussian Dispensatory directs it to be washed in ten times its weight of distilled water, and diluted sulphuric acid to be added until the predominant alkali be saturated, that the oxide of antimony combined with it may be precipitated. The whole powder is then to be well washed.

This is a preparation of no very great activity. It formerly bore the name of Diaphoretic antimony, from its supposed effect; but even that was doubted: and since the introduction of James's powder into general use, it has not been much employed. It may be given in doses of from five grains to half a drachm.

CHAP. VI.

SILVER.

NITRAS ARGENTI ; olim, CAUSTICUM LUNARE. *Ed.* ARGENTUM NITRATUM. *Dub.*

Nitrate of Silver. Nitrated Silver, formerly Lunar Caustic.

Take of

Purest silver, flattened into plates, and cut in pieces, four ounces ;
Diluted nitrous acid, eight ounces ;
Distilled water, four ounces.

Dissolve the silver in a phial with a gentle heat, and evaporate the solution to dryness. Then put the mass into a large crucible, and place it on the fire, which should at first be gentle, and afterward increased by degrees till the mass flows like oil ; then pour it into iron-pipes, previously heated and anointed with tallow. Lastly, keep it in a glass vessel well shut.

ARGENTUM NITRATUM. *Lond.*

Nitrated Silver.

Take of

Silver, one ounce ;
Diluted nitrous acid, four ounces.

Dissolve the silver in the diluted nitrous acid, in a glass-vessel, over warm sand ; then dry it by gently increasing the heat ; afterwards melt it in a crucible, taking care that the heat be not too great, and pour it into proper forms.

THE only difference between these formulæ is in the proportion of acid employed. The Edinburgh and Dublin colleges use equal weights of silver and acid. The London college use double the quantity of acid. The fact is, that nitrous acid is capable of dissolving more than half its weight of silver. Therefore, in the one case, a portion of silver will be left undissolved ; and, in the other, there will be an excess of acid, which, however, will be expelled by the heat necessary to bring the salt to a state of dryness. During the solution the metal is oxidized by the decomposition of part of the acid, while the nitrous gas disengaged at first dissolves in the acid, and gives it a green colour, which, however, disappears when the heat is increased so as to expel the gas. The acid employed must be very pure. If it contain, as the acid of commerce always does, sulphuric or muriatic acid, these react upon

the nitrate as soon as it is formed, and a white precipitate, consisting of sulphate and muriate of silver, falls to the bottom.

The method which the refiners employ for examining the purity of their aquafortis (the name they give to dilute nitrous acid), and purifying it if necessary, is to let fall into it a few drops of a solution of nitrate of silver already made: if the liquor remain clear, and grow not in the least turbid or whitish, it is fit for use; otherwise, they add a small quantity more of the solution, which immediately turns the whole of a milky white colour; the mixture being then suffered to rest for some time, deposits a white sediment, from which it is cautiously decanted, examined again, and, if necessary, farther purified by a fresh addition of this solution.

It is necessary to employ very pure water in this process, for the muriates and earthy salts which common water generally contain, precipitate part of the silver in a state of a muriate or oxide. If distilled water be not used, the water should be added to the acid before it be tried and purified by the nitrate of silver.

The solution will go on the more speedily, if the silver, flattened into thin plates, be rolled loosely up, so that the several surfaces do not touch each other. By this management, a greater extent of the surface is exposed to the action of the menstruum, than when the plates are cut in pieces and laid above each other. If the silver be alloyed with copper, the solution will have a permanent greenish blue colour, and acquire a bright blue on the addition of ammonia. If it contain gold, the gold is not dissolved, but is found at the bottom of the solution, in the form of a black or deep purple powder.

The crucible ought to be of silver or porcelain; as, with the common crucibles, the loss arising from the nitrate of silver sinking into their substance is too great. It ought also to be large enough to hold five or six times the quantity of the dry matter; for it bubbles and swells up greatly, so as otherwise to be apt to run over. During this time, also, little drops are now and then spirited up, whose causticity is increased by their heat, against which the operator ought therefore to be on his guard. The fire must be kept moderate till this ebullition ceases, and till the matter becomes consistent in the heat that made it boil before: when the fire is to be quickly increased, till the matter flows thin at the bottom like oil, on which it is to be immediately poured into the mould; for if the heat be continued after this, the nitrate of silver begins to be decomposed, and the silver is reduced.

In want of a proper iron mould, one may be formed in a mass of tempered tobacco pipe clay, not too moist, by making, with a smooth stick, previously greased, as many holes as there is occasion for: pour the liquid matter into these cavities, and when

congealed take it out by breaking the mould. Each piece is to be wiped clean from the grease, and wrapt up in soft dry paper, not only to keep the air from acting upon them, but likewise to prevent their corroding or discolouring the fingers in handling.

Nitrate of silver is crystallizable. Its crystals are brilliant plates, having a variable number of sides. Their taste is austere, and intensely bitter. They are very soluble in water, but permanent in the air, and not deliquescent. They are decomposed by heat, light, phosphorus, charcoal, many metals, all the alkalies and earths, sulphuric, muriatic, phosphoric and fluoric acids, and by the salts they form. When deprived of water, and melted according to the directions of the colleges, it forms a black or dark grey coloured mass, which, when broken, appears to consist of radii, diverging from the centre. It is not deliquescent when free from copper, which is seldom the case. It may, however, be prepared perfectly pure, even from a solution containing copper, by evaporating and crystallizing it as long as it furnishes firm tabular crystals. These are then to be washed with a little distilled water, and melted with a gentle heat. The nitrate of copper remains in the mother water, from which the silver it contains, may be precipitated by muriatic acid.

Medical use.—A strong solution of nitrate of silver corrodes and decomposes animal substances; in a more diluted state it stains them of an indelible black; and for this purpose it is now used as an indelible marking ink. The fused nitrate of silver is the strongest and most manageable caustic we possess, and is employed to remove fungous excrescences, callous edges, warts, strictures in the urethra, and the like. It is also used to destroy the venereal poison in chancres, before it has acted on the system. A weak solution of it may be applied as a stimulus to indolent ulcers, or injected into fistulous sores.

Notwithstanding its causticity, it has been given internally. Boerhave, Boyle, and others, commend it highly in hydropic cases. The former assures us, that made into pills with crumb of bread and a little sugar, and taken on an empty stomach (some warm water sweetened with honey being drank immediately after) it purges gently without griping, and brings away a large quantity of water, almost without the patient's perceiving it: that it kills worms, and cures many inveterate ulcerous disorders. He nevertheless cautions against using it too freely, or in too large a dose; and observes, that it always proves corrosive and weakening to the stomach.

It has been more recently employed, and with success, in epilepsy and angina pectoris. On account of its very great activity, each pill should not contain above one-eighth or one-fourth of a grain.

CHAP. VII.

COPPER.

ÆRUGO PRÆPARATA. *Dub.*
Prepared Verdegris.

Let the verdegris be ground to powder, and the minute particles be separated in the manner directed for the preparation of crabs claws.

Lond.

Verdegris is to be prepared as other substances not soluble in water.

The intention of this process is merely to obtain the sub-acetate of copper in the state of the most minute mechanical division.

Off. prep.—Liquor cupri ammoniati, *Lond. Dub.*

SOLUTIO SULPHATIS CUPRI COMPOSITA; olim, AQUA
STYPTICA. *Ed.*

Compound Solution of Sulphate of Copper, formerly Styptic Water.

Take of

Sulphate of copper,

Sulphate of alumina, each three ounces;

Water, two pounds;

Diluted sulphuric acid, an ounce and a half.

Boil the sulphates in the water to dissolve them, and then add the acid to the liquor filtered through paper.

In this preparation, the substances dissolved in the water exert no chemical action on each other, and the composition was probably contrived from the false idea, that the sum of the powers of substances having similar virtues, was increased by mixing them with each other.

Medical use—It is chiefly used as a styptic for stopping bleedings at the nose; and for this purpose, cloths or doffils, steeped in the liquor, are to be applied to the part.

AMMONIARETUM CUPRI; olim, CUPRUM AMMONIACUM.
*Ed.**Ammoniaret of Copper, formerly Ammoniacal Copper.*

Take of

Purest sulphate of copper, two parts;

Carbonate of ammonia, three parts.

Rub them carefully together in a glass mortar, until, after the effervescence has entirely ceased, they unite into a violet-coloured mass, which must be wrapped up in blotting paper, and first dried on a chalk stone, and afterwards by a gentle heat. The product must be kept in a glass phial well closed.

CUPRUM AMMONIATUM. *Dub.**Ammoniated Copper.*

Take of

Vitriolated copper, half an ounce;

Mild volatile alkali, an ounce and a half.

Triturate them in a glass mortar, until, after the effervescence has entirely ceased, they unite into a mass, which is to be wrapped up in bibulous paper, and dried upon a layer of gypsum, placed in warm sand. It is afterwards to be kept in a phial, closed with a glass stopper.

THE difference between the proportions of the ingredients of this preparation, directed by the two colleges, is very striking. We know of no experiments to ascertain which of them is most correct. It may seem strange that directions are given so particularly concerning the manner of drying a mixture which is prepared by rubbing two dry substances together. But such a phenomena is by no means uncommon, and arises from the quantity of water of crystallization contained in the ingredients being greater than what is required by the new compound formed: as soon, therefore, as the ingredients begin to act upon each other, a quantity of water is set at liberty, which renders the mass moist.

The nature of this compound, and consequently the name which should be given it, are not yet sufficiently ascertained. Prepared according to the directions of the colleges, it evidently contains oxide of copper, ammonia, and sulphuric acid. If these substances be chemically combined, it should be denominated the Sulphate or Sub-sulphate of copper and ammonia. By the exposure to the air during its exsiccation, and by keeping, it is apt to lose its blue colour entirely, and become green, and is probably converted into carbonate of copper.

There is another way of preparing this substance, now directed by the Prussian Dispensatory, less economical indeed, but

more instructive to the student of chemistry, and less liable to variety in the product. Into a solution of sulphate of copper, in three times its weight of distilled water, drop water of ammonia, until the bluish green precipitate, which is formed at first, be redissolved, and the liquor regain its transparency, and become of a beautiful deep blue colour. Concentrate this solution by evaporation to one third, and mix it with about an equal quantity of alcohol, upon which the salt immediately precipitates in silky blue crystals, which are to be collected by filtration, dried, and kept in a phial with a ground-glass stopper.

Ammonia, having a stronger affinity for sulphuric acid than oxide of copper has, separates the oxide, which, being insoluble, is precipitated in the form of a bluish green powder. But as this oxide itself is soluble in ammonia, it is redissolved when more ammonia is added than is sufficient to saturate the acid. Instead of obtaining the compound thus formed in a dry state by evaporation, which would partly decompose it, advantage is taken of its insolubility in alcohol, which, from its more powerful affinity, separates the water of the solution, and precipitates the cupreous salt in silky blue crystals. When a sufficient quantity of alcohol has been employed, it merely abstracts the water of the solution, and precipitates the whole of the saline matter contained in it, which we are therefore disposed to consider as a ternary compound of sulphuric acid, oxide of copper, and ammonia. By drying, this precipitate undergoes some alteration, for it is no longer totally soluble in water. As, however, the solution is easily effected by the addition of ammonia, it would appear that the alteration consists in the decomposition of part of the ammonia.

Medical use.—This preparation has frequently been serviceable at first in epilepsies; but, from its good effects often ceasing after it has been used for some time, frequent want of success and the disagreeable consequences with which its use is sometimes attended, it has not lately been much prescribed. It is employed by beginning with doses of half a grain, twice a-day; and increasing them gradually to as much as the stomach will bear. Dr. Cullen sometimes increased the dose to five grains.

LIQUOR CUPRI AMMONIATI; olim, AQUA SAPPHARINA,
Dub.

Liquor of Ammoniated Copper, formerly, Sapphire Water.

Take of

Lime water, fresh made, eight ounces;

Sal ammoniac, two scruples;

Verdegris prepared, four grains.

Mix and digest them for twenty-four hours, then pour off the pure liquor.

AQUA CUPRI AMMONIATI. *Lond.*
Water of Ammoniated Copper.

Take of

Lime water, one pint ;

Sal ammoniac, one drachm.

Let them stand together, in a copper vessel, till the ammonia be saturated.

IN this preparation the lime water decomposes the muriate of ammonia and forms muriate of lime ; while the ammonia disengaged immediately re-acts upon the oxide of copper contained in the verdegris, and renders it soluble. But as the quantity of lime employed is not sufficient to decompose all the muriate of ammonia, the solution contains muriate of ammonia, muriate of lime, and ammoniacet of copper, forming probably a triple salt, with the acetic acid. The mode of preparing this solution, adopted by the London college, is the remains of a fortuitous pharmacy, now justly exploded by the other colleges.

Medical use.—This compound solution is applied externally for cleaning foul ulcers, and disposing them to heal. It has been recommended also for taking off specks and films from the eyes ; but when used with this intention, it ought to be diluted with some pure water, as in the degree of strength in which it is here ordered, it irritates and inflames the eyes considerably.

CHAP. VIII.

IRON.

FERRI LIMATURA PURIFICATA. *Ed.*
Purified Filings of Iron.

Place a sieve over the filings, and apply a magnet, so that the filings may be attracted upwards through the sieve.

This process does not fulfil the purpose for which it is intended. For the adhesion of a very small particle of iron renders brass and other metals attractive by the magnet. The filings of iron

got from the shops of different artificers, which are always mixed with folder, and other metals, cannot be purified in this way, so as to render them fit for internal use; and indeed the only way they can be obtained sufficiently pure, is by filing a piece of pure iron with a clean file.

Off. prep.—Hydrosulph. ammon. *Ed.*

FERRI OXIDUM NIGRUM PURIFICATUM; olim, FERRI
SQUAMÆ PURIFICATÆ. *Edin.*

Purified Black Oxide of Iron, formerly Purified Scales of Iron.

Let the scales of the oxide of iron, which are to be found at the foot of the blacksmith's anvil, be purified by the application of a magnet. For the magnet will attract only the smaller and purer scales, and will leave those which are larger and less pure.

HERE the application of the magnet is useful, because these scales contain no foreign metal, but are mixed with earthy and other impurities, which could be separated in no other way. The Prussian Dispensatory direct this oxide to be prepared by moistening the carbonate of iron with olive oil, distilling it to dryness in a retort, and heating it almost to redness. The iron in this process is reduced from the state of peroxide to that of protoxide.

CARBONAS FERRI; olim, FERRI RUBIGO. *Ed.*

Carbonate of Iron, formerly Rust of Iron.

Moisten purified filings of iron frequently with water, that they may be converted into rust, which is to be ground into an impalpable powder.

FERRI RUBIGO. *Lond.*

Rust of Iron.

Take of

Iron filings, one pound.

Expose these to the air, often moistening them with water until they be corroded into rust; then powder them in an iron mortar, and wash over with distilled water the very fine powder. Moisten the residuum, which is not reduced by moderate triture to a powder, which may be easily washed over, and expose it again to the air; and, lastly, after having ground it in a mortar, wash it over. Dry the powder which is washed over.

Dub.

Take of

Iron wire, any quantity.

Cut it into pieces, which are to be moistened frequently with water, and exposed to the air until they be corroded into rust. Then powder them in an iron mortar, and by pouring water upon them, wash over the finest part of the powder, which is to be dried. The same process may be frequently repeated.

IRON is one of the most easily oxidized of the metals. It is capable of attracting oxygen from the air, and of decomposing water even in the cold. By exposure at the same time to air and moisture, it is very quickly oxidized, while it also absorbs carbonic acid, and is converted into a reddish brown pulverulent substance, well known by the name of rust of iron. For medical use it is prepared as the other substances insoluble in water. Apothecaries seldom make it themselves, but obtain it from persons who manufacture it in large quantities.

Off. prep.—Tinctura ferri mariati. *Lond.*

CARBONAS FERRI PRÆCIPITATUS. *Ed.*

Precipitated Carbonate of Iron.

Take of

Sulphate of iron, four ounces;

Carbonate of soda, five ounces;

Water, ten pounds.

Dissolve the sulphate in the water, and add the carbonate of soda, previously dissolved in a sufficient quantity of water, and mix them thoroughly.

Wash the carbonate of iron, which is precipitated, with warm water, and afterwards dry it.

On mixing the solutions of these salts together, there is an immediate mutual decomposition. Sulphate of soda is formed, which remains in solution, and carbonate of iron, which is precipitated of a green colour. The precipitate when first formed, is the carbonate of black oxide of iron, or contains the iron in the state of black oxide, the state in which it exists in the green sulphate of iron; but in the process of drying, it absorbs more oxygen, becomes of a red colour, and is converted into the carbonate of red oxide of iron. As the precipitate is extremely light and bulky, it is not easily separated by allowing it to subside, and pouring off the clear liquor; filtration should therefore be employed. The carbonate of soda is used in preference to the carbonate of potash, on account of the greater solubility of sulphate of soda than of sulphate of potash, which renders the subsequent ablution of the salt more easy.

The carbonate of iron is an excellent and safe chalybeate. It may be given in doses of from five grains to sixty; but all chalybeates answer better in small doses, frequently repeated, than in large doses.

AQUA FERRI AËRATI. *Dub.*

Water of Aerated Iron.

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It is prepared in the same manner as the water of fixed air, by suspending in the water half an ounce of iron wire.

THIS is a very elegant chalybeate. The iron is in the state of black oxide, and is dissolved by means of carbonic acid. It was first prepared by Bergmann, in imitation of the natural chalybeate waters, and it forms an excellent substitute for them.

SULPHAS FERRI. *Ed.*

Sulphate of Iron.

Take of

Purified filings of iron, six ounces;

Sulphuric acid, eight ounces;

Water, two pounds and a half.

Mix them, and after the effervescence ceases, digest the mixture for some time upon warm sand; then strain the liquor through paper, and after due evaporation set it at rest to crystallize.

FERRUM VITRIOLATUM. *Lond.*

Vitriolated Iron.

Take of

Filings of iron,

Vitriolic acid, each eight ounces;

Distilled water, three pints.

Mix them in a glass vessel; and, when the effervescence has ceased, place the mixture for some time upon hot sand; then pour off the liquor, straining it through paper; and, after due evaporation, set it aside to crystallize.

FERRUM VITRIOLATUM; olim, SAL MARTIS. *Dub.*

Vitriolated Iron, formerly Salt of Steel.

Take of

Iron wire, two ounces.

Vitriolic acid, three ounces and a half;

Water, two pounds.

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Mix the acid by degrees with the water in a glass vessel, and gradually add the iron-wire cut into pieces; digest the mixture for some time, and strain it through paper. Lastly, set aside the liquor, after due evaporation, to crystallize by slow refrigeration.

ALTHOUGH the native sulphate of iron may be purified by solution, filtration, and crystallization, sufficiently, for many purposes, yet it cannot be procured perfectly pure, except by the direct union of sulphuric acid and iron; and as it is of consequence that it should be pure when administered internally, directions for its preparation have been given by all the colleges. The differences which may be observed in the proportions of the materials employed, is of little consequence, as sulphuric acid and iron unite only in one proportion.

Iron scarcely acts upon sulphuric acid, unless assisted by heat. It then becomes oxidized, by abstracting oxygen from a portion of the acid, and converting it into sulphureous acid gas or sulphur, and combines with the remainder of the acid. But it acts with great rapidity on diluted sulphuric acid; in which cause it is not oxidized at the expence of the acid itself, but by decomposing the water, and therefore the hydrogen of the water is separated in the form of gas. The action of the acid and iron upon each other often ceases before the acid is nearly saturated, and may be renewed by the addition of a little water. The reason is, that all the water which was not decomposed is employed to dissolve the sulphate of iron formed.

The properties and uses of sulphate of iron have been already mentioned.

SULPHAS FERRI EXSICCATUS. *Ed.*

Dried Sulphate of Iron.

Take of

Sulphate of iron, any quantity.

Expose it to the action of a moderate heat in an unglazed earthen vessel, until it become white and perfectly dry.

The heat applied here must not be so great as to decompose the sulphate of iron, but only to deprive it of its water of crystallization.

OXIDUM FERRI RUBRUM. *Ed.*

Red Oxide of Iron.

Expose dried sulphate of iron to an intense heat, until it is converted into a very red matter.

By the violent heat applied in this preparation, the sulphate of iron is completely decomposed, and copious white fumes are expelled. The iron is converted into the red oxide; part of the sulphuric acid is therefore reduced to the state of sulphureous acid, and the rest of the acid is expelled in a very concentrated state. This process was formerly employed in this country, and still is employed in Germany, for the preparation of sulphuric acid; which, however, from the presence of the sulphureous acid, was possessed of some peculiar properties, such as emitting fumes and crystallizing. The residuum is composed of red oxide of iron, combined with a little red sulphate of iron, which renders it deliquescent. To obtain the oxide perfectly pure, the residuum must therefore be washed with water, and dried quickly, to prevent the absorption of carbonic acid.

Off. prep.—Murias ammoniæ et ferri. *Ed.*

TINCTURA MURIATIS FERRI. *Ed.*

Tincture of Muriate of Iron.

Take of

Purified black oxide of iron in powder three ounces;
Muriatic acid, about ten ounces, or as much as may be sufficient to dissolve the powder.

Digest by a gentle heat, and after the powder is dissolved, add of alcohol

As much as will make the whole quantity of liquor amount to two pounds and a half.

TINCTURA FERRI MURIATI. *Lond. Dub.*

Tincture of Muriated Iron.

Take of

The rust of iron (iron-wire, *Dub.*) half a pound;
Muriatic acid, three pounds;
Rectified spirit of wine, three pints.

Pour the muriatic acid on the rust of iron in a glass vessel; and shake the mixture now and then during three days. Set it by, that the feces may subside; then pour off the liquor; evaporate this to one pint, and, when cold, add it to the vinous spirit.

In making this preparation, each of the colleges uses iron in a different state; the Dublin college, metallic iron; the Edinburgh, the black oxide; and the London college, the carbonate of the red oxide. There is no difference between the solutions of iron and of its black oxide; because the iron is converted into the state of black oxide by the decomposition of the water, before it is dissolved; and accordingly, when iron is dissolved in

muriatic acid, there is a disengagement of hydrogen gas; whereas the black oxide is dissolved without any effervescence. But muriatic acid is capable of combining either with the black or red oxides of iron, and forms with each, salts, having distinctive properties.

The red muriate of iron is not crystallizable; has a dark orange colour; is deliquescent; forms a brown red solution, having a very astringent taste; and is soluble in alcohol. The green muriate is crystallizable; has little colour; is very soluble in water, forming a pale green solution; and is insoluble in alcohol. But the aqueous solution of green muriate attracts oxygen so rapidly from the atmosphere, that unless the access of the air be totally excluded, it is always partially converted into red muriate. The solutions of iron and of its black oxide, are accordingly found always to contain a greater or less proportion of red muriate, and are therefore not uniform or constant in their properties. Besides, as it is only the red muriate which is soluble in alcohol, it appears to us that it is better, according to the directions of the London college, to use the red carbonate of iron, by which means we obtain an unmixed and permanent solution of the red muriate. Muriate of iron is also formed, when we dissolve the sulphuret of iron in muriatic acid for the purpose of procuring sulphuretted hydrogen gas. It is also the residuum which remains in the retort after the sublimation of muriate of ammonia and iron.

When well prepared, the alcoholic solution of muriate of iron has a yellowish colour, and very astringent taste. It is an excellent chalybeate, and may be given in doses of ten or twenty drops twice or thrice a-day, in any proper vehicle.

MURIAS AMMONIÆ ET FERRI; olim, FLORES MARTIALES.
Edin.

Muriate of Ammonia and Iron; formerly Martial Flowers,

Take of

Red oxide of iron, washed and again dried;

Muriate of ammonia, equal weights;

Mix them thoroughly, and sublime.

FERRUM AMMONIACALE. *Lond,*
Ammoniacal Iron.

Take of

Iron filings, one pound;

Sal ammoniac, two pounds.

Mix and sublime. What remains at the bottom of the vessel mix by rubbing together with the sublimed matter, and sublime a second time.

ALTHOUGH at a low temperature ammonia decomposes the muriate of iron, at a high temperature iron and its oxides decompose muriate of ammonia. But as muriate of ammonia is itself a volatile salt, great part of it escapes undecomposed; so that the product is a mixture of muriate of ammonia with red muriate of iron. According to the formula of the Edinburgh college, the decomposition is effected by simple affinity. As soon as the oxide of iron acts on the muriate of ammonia, the ammonia which is separated comes over: then as the heat increases, undecomposed muriate of ammonia is sublimed; which, as the process advances, is mixed with an increasing proportion of muriate of iron. In the process of the London college, the decomposition is more complex; and a considerable quantity of hydrogen gas is produced. Both colleges employ a much larger quantity of iron than is necessary. According to the German pharmacutists, if the iron be equal to one sixteenth of the muriate of ammonia, it is sufficient. The new Prussian Dispensatory directs one ounce of iron to be dissolved in a mixture of two parts of muriatic acid, and one of nitrous acid; this solution of red muriate of iron to be mixed with twelve ounces of muriate of ammonia, and the whole evaporated to dryness; and the dry mass to be sublimed in a wide necked retort, with a heat increased to redness.

Whatever process be employed, the heat must be applied as quickly as possible; and the sublimed product thoroughly mixed by trituration, and kept in well-stopt glass vessels. It should have a deep orange colour, and a smell resembling saffron, and should deliquesce in the air.

This preparation is supposed to be highly aperient and attenuating; though no otherwise so than the rest of the chalybeates, or at most only by virtue of the saline matter joined to the iron. It has been found of service in hysterical and hypochondriacal cases, and in distempers proceeding from a laxity, and weakness of the solids, as the rickets. From two or three grains to ten may be conveniently taken in the form of a bolus.

TINCTURA FERRI AMONICALIS. *Lond.* *Tincture of Ammonical Iron.*

Take of

Ammoniacal iron, four ounces;

Proof-spirit, one pint.

Digest and strain.

THIS is merely a spiritous solution of the preceding article, and is a much less elegant medicine than the simple tincture of muriate of iron.

FERRUM TARTARISATUM. *Lond.**Tartarized Iron.*

Take of

Filings of iron, one pound ;

Crystals of tartar, in powder, two pounds.

Mix them with distilled water into a thick mass, which is to be exposed to the action of the air for eight days in a wide glass vessel; then grind the matter, after being dried in a sand bath to a very minute powder.

THIS is in fact a triple tartrate of iron and potash, the excess of acid in the super-tartrate of potash being saturated by oxide of iron. The iron is oxidized during the first part of the process, in which it is moistened and exposed to the action of the air.

Tartrate of potash and iron may also be formed, by boiling a solution of super-tartrate of potash with iron, or, what is still better, with some of the oxides of iron, until the excess of acid be saturated. The compound, according to Thenard, is very soluble, varies in colour according to the state of the oxide; crystallizes in small needles, and has a chalybeate taste. It is not precipitated by alkalies or alkaline carbonates. It is decomposed by sulphuretted hydrogen and its compounds, and by gallic acid. The editors of Gren's Pharmacy say, that a solution of iron in super-tartrate of potash, furnishes by evaporation greenish sparose permanent crystals, difficultly soluble; which is surely a mistake; at least it neither corresponds with Thenard's account, nor with the old name of this preparation, Mars Solubilis.

The tartrate of iron and potash may be given in the form of powder or bolus, in doses of from ten to thirty grains.

VINUM FERRI. *Lond.**Wine of Iron.*

Take of

Iron filings, four ounces ;

Spanish white wine, four pints.

Digest for a month, often shaking the vessel, and then strain.

VINUM FERRATUM; olim, VINUM CHALYBEATUM. *Dub.**Ironated Wine, formerly Chalybeate Wine.*

Take of

Iron wire cut in pieces, four ounces ;

White Rhenish wine, four pints.

Digest for a month, often shaking the vessel, and then strain.

THIS is merely a solution of the preceding article in wine ; for the iron is only dissolved in the wine by means of the super-tartrate of potass it contains. The Rhenish wine directed by the Dublin college, will, therefore, dissolve a larger quantity of iron than the Spanish white wine of the London college. But a solution of a known proportion of the preceding article in wine, will give a medicine of more equal powers, and may be made extemporaneously.

The dose is from a drachm to half an ounce, repeated twice or thrice a-day in chlorotic cases.

TINCTURA FERRI ACETATI. *Dub.*

Tincture of Acetated Iron.

Take of

Acetated vegetable alkali,
Vitriolated iron, each one ounce ;
Alcohol, two pounds.

Rub the acetated alkali and vitriolated iron together in a glass mortar, until the mass deliquesces ; then add, during the trituration, the alcohol, and strain the solution.

THE acetate of potass and sulphate of iron decompose each other, and form acetate of iron, and sulphate of potass. But as the sulphate of potass is not soluble in alcohol, the solution, after filtration, is an alcoholic solution of acetate of iron. The acetic acid is also capable of combining with both oxides of iron ; and as the iron in the sulphate is in the state of black oxide, which has a strong attraction for oxygen, it is probable that the acetate prepared in the way directed is a mixed acetate.

It has an extremely styptic taste, and is given in doses of thirty or forty drops.

CHAP. IX.

MERCURY.

HYDRARGYRUM PURIFICATUM. *Dub.**Purified Quicksilver.*

Take of

Quicksilver, six pounds.

Draw off four pounds by slow distillation.

HYDRARGYRUS PURIFICATUS. *Lond.**Purified Quicksilver.*

Take of

Quicksilver,

Iron-filings, each four pounds.

Rub them together, and distil from an iron-vessel.

Edin.

Take of

Quicksilver, four parts ;

Filings of iron, one part.

Rub them together, and distil from an iron-vessel.

THE quicksilver of commerce is often adulterated with lead, tin, or other metals, which renders it unfit for internal use, and for many preparations. It therefore becomes necessary to purify it, and fortunately its comparatively great volatility supplies us with an easy process. The Dublin college distil it simply without any addition ; but, lest towards the end of the process the mercury should elevate any impurities along with it, they draw off but two thirds. The principal objection to this process is the want of economy ; for although the remaining third may be used for some purposes, its value is very much depreciated. As iron has a much stronger affinity for almost all the substances with which quicksilver may be adulterated than quicksilver has, by adding iron-filings we may draw off the whole quicksilver by distillation, without any fear of the impurities rising along with it. The London college add an equal weight of iron-filings, but so large a quantity causes the size of the distilling apparatus to be unnecessarily increased. The Edinburgh college use one fourth, which is certainly enough.

Glass-retorts are inadmissible in this distillation ; because, when the mercury begins to boil, the concussion is so great, that they would certainly be broken. Iron-retorts are the best, although strong earthen ones may be also used. The receiver may be of the same materials, or of glass, if we wish to inspect the progress of the operation ; but in this case we must interpose an adopter between the retort and receiver, and fill the receiver nearly full of water, that the mercury may not crack it by falling hot into it. The retort employed should be so large, that the quicksilver should not fill above one third of it.

ACETIS HYDRARGYRI. *Ed.**Acetite of Quicksilver.*

Take of

Purified quicksilver, three ounces ;

Diluted nitrous acid, four ounces and a half, or a little more than may be required for dissolving the mercury ;

Acetite of potash, three ounces ;

Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid ; and after the effervescence has ceased, digest if necessary, with a gentle heat, until the quicksilver be entirely dissolved. Then dissolve the acetate of potash in the boiling water, and immediately to this solution, still hot, add the former, and mix them by agitation. Then set the mixture aside to crystallize. Place the crystals in a funnel, and wash them with cold distilled water ; and, lastly, dry them with as gentle a heat as possible.

HYDRARGYRUS ACETATUS. *Lond.**Acetated Quicksilver.*

Take of

Purified quicksilver,

Diluted nitrous acid, each half a pound ;

Acetated kali, three ounces ;

Tepid distilled water, two pounds.

Mix the quicksilver with the diluted nitrous acid in a glass-vessel, and digest them for twenty-four hours with a gentle heat, that the quicksilver may be dissolved. Pour the nitrated quicksilver thus prepared into the acetated kali, previously dissolved in the tepid (90°) water, that acetated quicksilver may be formed, which is to be first washed with cold distilled water, and afterwards dissolved in a sufficient quantity of boiling distilled water. Filter this solution through paper, and set it aside to crystallize.

HYDRARGYRUM ACETATUM. *Dub.*
Acetated Quicksilver.

Take of

Purified quicksilver,
 Diluted nitrous acid, each half a pound;
 Acetated vegetable alkali, three ounces;
 Distilled water, heated to about the ninetieth degree, two
 pounds and a half.

Dissolve the mercury in the acid with a gentle heat. Mix the liquor, before crystals form in it by cooling, with the water in which the acetated vegetable alkali has been previously dissolved. Wash the precipitate with cold distilled water, then pour upon it twenty-four pounds of distilled water, and boil a little. Having removed the vessel from the fire, let it stand at rest for about ten minutes; and, lastly, pour off from the sediment the clear liquor, and let the acetated quicksilver crystallize in it by slow refrigeration.

THESE processes are all fundamentally the same. They differ chiefly in the proportions. Those of the Edinburgh college were ascertained by very careful experiment, and if its directions be accurately followed, the preparation succeeds admirably. Nitrate of mercury is decomposed by acetate of potash; and the products are acetate of mercury and nitrate of potash. The nitrate of potash being much more soluble than the acetate of mercury, remains in solution after the latter is separated by crystallization. Mercury is capable of forming different combinations with nitrous acid, which possess each their characteristic properties. When we employ a sufficient quantity of acid to dissolve the mercury without the assistance of heat, and to retain it in solution there is always an excess of acid, and therefore it is a solution of super-nitrate of mercury. If we evaporate this solution very gently, or if we add an additional quantity of mercury, and assist the action of the acid by a gentle heat, until nitrous gas begins to escape, we obtain nitrate of mercury crystallized in various forms. In these the mercury is in the state of protoxide. But if we assist the action of the acid by boiling, until nitrous gas ceases to escape, the mercury is converted into peroxide, and a larger quantity is dissolved. This solution is very apt to crystallize, both on cooling, and by the diminution of the quantity of acid during the process; and if we attempt to dilute the solution with water, a copious precipitate of sub-nitrate of mercury immediately takes place; and the solution contains super-nitrate of mercury. If the dilution be made with cold water, the sub-nitrate has a white colour, which, by a very slight application of heat, passes to a beautiful yellow, the colour which it has at first when separated by boil-

For making the acetate of mercury, the nitrate is prepared with a very gentle heat, and with excess of acid, that it may be retained in perfect solution, and that there may be no possibility of any admixture of sub-nitrate with the acetate formed. A larger proportion of acid is used by the Edinburgh college than by the other colleges, but by accurate experiment it was ascertained to be necessary for the success of the process. In mixing the solutions, we must be careful to pour the mercurial solution into that of the acetate of potash, because, by adopting the contrary procedure, the sub-nitrate of mercury will be precipitated undecomposed, if any peroxide be contained in the mercurial solution. For dissolving the acetate of potash, the London and Dublin colleges only use as much water as is capable of retaining the nitrate of potash in solution; the acetate of mercury is therefore precipitated, and is purified by again dissolving it in boiling water and crystallizing it. This part of the process is simplified by the Edinburgh college, who use as much water for dissolving the acetate of potash as is capable of retaining, so long as it is hot, the acetate of mercury in solution, and of allowing it to crystallize as it cools. In this way, therefore, it is procured at once sufficiently pure. The exsiccation of the acetate of mercury is an operation of great delicacy; for it is so spongy, that it retains the moisture with great obstinacy; and it is decomposed so easily, that heat can scarcely be employed. It is best dried by compressing it between several folds of bibulous paper.

The Prussian Dispensatory directs acetate of mercury to be prepared by dissolving two ounces of the red oxide of mercury in about seven ounces of concentrated acetic acid, and evaporating the solution to dryness.

Acetate of mercury is scarcely soluble in cold water, but dissolves readily in boiling water. It generally crystallizes in micaceous plates, and is extremely easy of decomposition.

It is supposed to be a mild preparation of mercury, and was the active ingredient of the celebrated Keyser's pills. In solution it has also been recommended externally, to remove freckles and cutaneous eruptions.

MURIAS HYDRARGYRI; olim, **MERCURIUS SUBLIMATUS CORROSIVUS**. *Ed.* **HYDRARGYRUS MURIATUS**. *Lond.* **HYDRARGYRUM MURIATUM CORROSIVUM**. *Dub.*

Muriate of Quicksilver, formerly Corrosive Sublimate. Muriated Quicksilver. Corrosive Muriated Quicksilver.

Take of

Purified quicksilver, two pounds;

Sulphuric acid, two pounds and a half;

Dried muriate of soda, four pounds.

Boil the quicksilver with the sulphuric acid in a glass vessel placed in a sand bath, until the matter be dried, which is to be mixed when cold in a glass vessel, with the muriate of soda; then sublime in a glass cucurbit, with a heat gradually increased. Lastly, separate the sublimed matter from the scoriæ.

By boiling the quicksilver to dryness with sulphuric acid, the metal is oxidized by the decomposition of part of the acid, and combines with the rest to form sub-sulphate of quicksilver. In the second part of the process, this sub-sulphate is decomposed by dried muriate of soda, muriate of quicksilver sublimes, and sulphate of soda remains behind, in Holland it is manufactured by subjecting to sublimation a mixture of dried sulphate of iron, nitrate of potash, muriate of soda, and quicksilver. In the former editions of the Edinburgh Pharmacopœia, the mercury was oxidized by boiling to dryness in nitrous acid, and then sublimed with muriate of soda and sulphate of iron. Bergmann recommends the sublimation of sub-nitrate of mercury and muriate of soda, and Mr. Murray seems inclined to prefer it to the new process.

Muriate of quicksilver crystallizes by sublimation in prismatic needles, forming a white semi-transparent mass. It is ponderous. Its taste is acrid, styptic, and durable. It is soluble in 20 parts of cold water, and in 2 at 212°. It is also soluble in 3.8 parts of alcohol at 70°, and in almost an equal weight of boiling alcohol. It gives a green colour to syrup of violets. It is not altered by exposure to the air, and is sublimed unchanged by heat. It is not decomposed by any of the acids; but is soluble, without alteration, in the sulphuric, nitric, and muriatic acids. It is precipitated by all the alkalies and earths, of an orange-yellow colour, which gradually changes to a brick red; and by their carbonates, of a permanent yellow colour. Ammonia forms with it an insoluble, white, triple salt. It is also decomposed by several of the metals. It consists, according to Mr. Chevenix, N°. 1, and to Mr. Zaboada, N°. 2, of

	N°. 1.	N°. 2.		N°. 1.	N°. 2.
Quicksilver	69.7	71.5	} Oxide of mercury	82	80
Oxygen	12.3	8.5			
			Muriatic acid	18	20
				<hr/>	<hr/>
				100	100

And the oxide thereof consists of

	N ^o . 1.	N ^o . 2.
Quicksilver	85	90
Oxygen	15	10
	<hr/> 100	<hr/> 100

Medical use.—Muriate of mercury is one of the most violent poisons with which we are acquainted. Externally it acts as an escharotic or a caustic; and in solution it is used for destroying fungous flesh, and for removing herpetic eruptions; but even externally it must be used with very great caution. It has, however, been recommended to be given internally, by the respectable authorities of Boerhaave and Van Swieten; and it is the active ingredient of all the empirical antivenereal syrups. Were it really capable of curing the venereal disease, or equal in efficacy to the common modes of administering mercury, it would possess many advantages over them in other respects: but that it cannot be depended upon, is almost demonstrated by its use as an antivenereal being very much confined to the quacks, and by the testimony of the most experienced practitioners. Mr. Pearson says, that it will sometimes cure the primary symptoms of syphilis, especially if it produce considerable soreness of the gums, and the common effects of mercury: but that it will often fail in removing a chancre; and where it has removed it, that the most steady perseverance will not secure the patient from a constitutional affection. It has on some occasions, however, a useful auxiliary to a mercurial course, in quickly bringing the system under the influence of mercury, and in supporting its action after the use of frictions, and it is peculiarly efficacious in relieving venereal pains, in healing ulcers of the throat, and in promoting the desquamation of eruptions.

Off. prep.—Sub-murias hydrarg. *Ed. Lond. Dub.* Calx. hydr. alba. *Lond*

SUB-MURIAS HYDRARGYRI; olim, CALOMELAS. *Ed.*

Sub-muriate of Quicksilver, formerly Calomel.

Take of

Muriate of quicksilver, ground to powder in a glass-mortar, four ounces;

Purified quicksilver, three ounces.

Rub them together in a glass-mortar, with a little water, to prevent the acrid powder from rising, until the mercury be extinguished; and having put the powder, after being dried, into an oblong phial, of which it fills only one third, sublime from warm sand. After the sublimation is finished, having

broken the phial, throw away both the red matter found near the bottom of the phial, and the white matter near its neck, and sublime the rest of the mass. Grind this into a very minute powder, which is lastly to be washed with boiling distilled water.

HYDRARGYRUM MURIATUM MITE SUBLIMATUM. *Dub.*
Mild Sublimated Muriated Quicksilver.

Take of

Corrosive muriated mercury, one pound :

Purified quicksilver, nine ounces.

Rub them together until the globules disappear, and sublime. Rub the sublimed matter with the residuum, and repeat the sublimation. Lastly, wash the sublimed matter with frequent affusions of boiling distilled water.

CALOMELAS. *Lond.*
Calomel.

Take of.

Muriated quicksilver, one pound ;

Purified quicksilver, nine ounces ;

Rub them together, until the globules disappear and sublime ; then rub the whole matter again together and sublime. Repeat the sublimation in the same manner four times. Afterwards triturate the matter into a very subtile powder, and wash it by the affusion of boiling distilled water.

WHEN quicksilver is triturated with muriate of quicksilver, it abstracts from the oxidized quicksilver of the muriate a part of its oxygen, and the whole mass assumes a blackish grey colour. When this is exposed to a degree of heat sufficient to convert it into vapour, the action of the different portions of quicksilver upon each other, and upon the muriatic acid, is much more complete : and the whole is converted into a solid white mass, consisting of mercury in a state of less oxidizement, and combined with less acid than in the muriate.

The trituration of the muriate of mercury is a very noxious operation, as it is almost impossible to prevent the finer particles from rising and affecting the operator's eyes and nostrils. To lessen this evil, the Edinburgh college direct the addition of a little water. In the second part of the process, when the heat is applied, a small portion of quicksilver and undecomposed muriate first arise, and condense themselves in the highest part or neck of the phial ; then the submuriate rises, and, being less volatile, condenses in the upper half of the body, while a small quantity of quicksilver in a state of considerable oxidizement remains fixed.

or near the bottom. The Edinburgh college separate the submuriate from the other matters, and sublime it again. The other colleges triturate the whole together again, and re-sublime it, the Dublin college once, the London four times. As in the first sublimation, a portion of the quicksilver and of the muriate of quicksilver always arise undecomposed, a second sublimation is necessary, especially if we triturate the whole products of the first sublimation together; but any further repetition of the process is perfectly useless. Lest any portion of muriate should have escaped decomposition, the submuriate must beedulcorated with boiling distilled water, until the water which comes off forms no precipitate with alkalies.

Submuriate of mercury is generally obtained in the form of a white solid mass; but is capable of crystallizing in tetrahedral prisms terminated by pyramids. It has no taste, and is scarcely soluble in water or in alcohol. It is less volatile than muriate of mercury. It is blackened by light, and becomes brown when triturated with lime water or the alkalies. It is converted by oxymuriatic acid into muriate of quicksilver. According to Mr. Chenevix N^o. 1, and to M. Zaboada N^o. 2. it consists of

	N ^o . 1.	N ^o . 2.		N ^o . 1.	N ^o . 2.
Quicksilver,	79	85	} Oxide of quicksilver,	88.5	89.4
Oxygen,	9.5	4.4			
			Muriatic acid,	11.5	10.6
				<hr/>	<hr/>
				100	100
And its oxide contains,			Quicksilver,	N ^o . 1. 89.3	N ^o . 2. 95.
			Oxygen,	10.7	5.
				<hr/>	<hr/>
				100	100

According to Mr. Chenevix's analysis, therefore, 54 parts of quicksilver seem sufficient to convert 100 of the muriate into submuriate; but according to Zaboada's 75, which is exactly the proportion directed by the colleges.

Medical use.—The submuriate of quicksilver is one of the best mercurials we possess. By proper management it may be made to increase, in a remarkable manner, almost any of the secretions or excretions. One grain mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye, to remove specks from the cornea. Given in doses of one grain morning and evening, or in larger doses combined with opium, to prevent it from acting as a purgative, it excites pyalism. In larger doses

of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with sudorifics, sudorific.

It is one of the preparations of mercury which is capable of curing syphilis in every form. It also produces very powerful and salutary effects in obstructions and chronic inflammations of the viscera, especially of the liver; and, in general, it is applicable to every case in which mercurials are indicated.

Off. prep.—Pulv. scam. cum calom. *Lond.* Pulv. stibii comp. *Dub.*

SUB-MURIAS HYDRARGYRI PRÆCIPITATUS. *Edin.*
Precipitated Sub-muriate of Quicksilver.

Take of

Diluted nitrous acid,

Purified quicksilver, each eight ounces;

Muriate of soda, four ounces and a half;

Boiling water, eight pounds.

Mix the quicksilver with the diluted nitrous acid, and towards the end of the effervescence digest with a gentle heat, frequently shaking the vessel in the meantime. But it is necessary to add more quicksilver to the acid than it is capable of dissolving, that a perfectly saturated solution may be obtained.

Dissolve at the same time the muriate of soda in the boiling water, and into this solution pour the other while still hot, and mix them quickly by agitation, pour off the saline liquor after the precipitate has subsided, and wash the sub-muriate of quicksilver by repeated affusions of boiling water, which is to be poured off each time after the deposition of the sub-muriate, until the water come off tasteless.

HYDRARGYRUS MURIATUS MITIS. *Lond.*
Mild Muriated Quicksilver.

Take of

Purified quicksilver,

Diluted nitrous acid, of each half a pound.

Mix in a glass vessel, and set it aside until the quicksilver be dissolved. Let them boil, that the nitrated quicksilver may be dissolved. Pour out the boiling liquor into a glass-vessel, containing another boiling liquor, consisting of

Muriatic salt, four ounces;

Distilled water, eight pints.

After the powder has subsided to the bottom of the vessel, pour off the clear supernatant liquor, and wash the powder which remains behind, till it becomes insipid, with frequent affusions of hot water; then dry it on blotting-paper with a gentle heat.

HYDRARGYRUM MURIATUM MITE PRÆCIPITATUM. *Dub.*
Precipitated Mild Muriated Quicksilver.

Take of

Purified quicksilver, six ounces and a half ;

Diluted nitrous acid, six ounces.

Digest in a glass vessel with a moderate heat for six hours, occasionally agitating it. Towards the end of the solution, increase the heat so as to make the liquor boil for a little, which is then to be poured off from the quicksilver remaining undissolved, and mixed with ten pounds of boiling water, in which four ounces of common salt have been previously dissolved. Wash the powder which subsides to the bottom with warm distilled water, as long as the liquor decanted from it is rendered turbid from the addition of a few drops of mild ley.

IN the first part of this process, a solution of nitrate of quicksilver, with excess of oxide, is formed. In the second, there is a mutual decomposition of this nitrate, and of the muriate of soda ; nitrate of soda is formed, and muriate of quicksilver, with excess of oxide. In this preparation, our object is to obtain the insoluble compound which results from the combination of the protoxide of mercury with muriatic acid. In this view, the application of heat in dissolving the mercury in the nitrous acid, is improper ; for a portion at least of the mercury is converted into its peroxide, which occasions, in the first place, the formation of a little sub-nitrate of mercury, when poured into the saline solution ; and secondly, the formation of a quantity of muriate of mercury (corrosive sublimate) which must be washed away. Accordingly, Mr. Murray has found much more mild and less corrosive muriate of mercury is formed when the solution is made slowly and in the cold, than when the directions of the colleges are complied with.

When properly prepared, the sub-muriate obtained by precipitation scarcely differs from that obtained by sublimation. Göttling found no other difference than that the precipitated sub-muriate became grey, when triturated with lime-water, whereas the sublimed sub-muriate becomes black. But he exposed to heat half an ounce of the precipitated sub-muriate in a subliming apparatus ; scarcely a grain of a reddish matter remained fixed ; and the sublimed matter now became black when triturated with lime-water, and differed in no respect from sub-muriate prepared in the ordinary way by sublimation. It therefore would seem to be an improvement in the process, to sublime the sub-muriate after it is precipitated ; especially as by that operation it would be most effectually separated from any sub-nitrate which might be mixed with it.

There is still another way of preparing the sub-muriate of mercury, without using corrosive sublimate, which must be noticed. It was contrived by Hermbstaedt, and is recommended by Moench with the confidence derived from experience, as the very best process for preparing the sub-muriate of quicksilver.

Take of

Pure quicksilver, seven ounces and a half;

Sulphuric acid, four ounces;

Dried muriate of soda, five ounces and a half.

Distil in a glass-retort the sulphuric acid, with four ounces of the quicksilver, until they be converted into a dry white mass, Triturate the sulphate of mercury thus formed, with the remaining three ounces and a half of quicksilver, until the globules disappear; then add the muriate of soda; mix them and sublime. As the product of the first sublimation still contains unoxidized quicksilver, it is to be again triturated and sublimed. The sublimate being washed, is now pure sub-muriate of quicksilver, and weighs about six ounces.

THE theory of this process is the same with that of the formation of the muriate of quicksilver. The difference between the two products arises from the proportion of quicksilver being greater, and that of the muriate of soda employed being less. We are not prepared to state the comparative economy of these three processes described, for preparing sub-muriate of quicksilver; but of the last process, we may observe, that according to Mr. Chenevix's analysis, seven ounces and a half of quicksilver should furnish nine ounces and a half of sub-muriate of quicksilver, and according to M. Zaboada's nearly nine; so that there is evidently a considerable loss, which must be owing either to the formation of muriate of quicksilver, or of oxide of quicksilver. To diminish this loss, we might dissolve the residuum of the first sublimation, which is principally sulphate of soda, in the water with which the sublimate was washed, and precipitate the solution with carbonate of soda. We should thus regain the remaining portion of the quicksilver in the state of brown carbonate, which might be applied to many purposes. The same thing might be practised with advantage on the washings and residuums of several of the other preparations.

CALX HYDRARGYRI ALBA. *Lond.*

White Calx of Quicksilver.

Take of

Muriated quicksilver,

Sal ammoniac,

Dissolve first the sal ammoniac, afterwards the muriated quicksilver in distilled water, and add to these the water of prepared kali. Wash the powder until it become insipid.

In this preparation the Prussian college use carbonate of soda.

When to a solution of muriate of ammonia, there is added muriate of quicksilver, about thirty times more of the latter is dissolved than the same quantity of pure water is capable of dissolving; and there takes place a considerable increase of temperature. Now, as these facts sufficiently prove a reciprocal action of the two salts, and as there is no decomposition, it is evident that they must have combined to form a triple salt; especially as they cannot be again separated either by sublimation or crystallization. This compound may therefore, with propriety, be termed Muriate of Mercury and Ammonia. It is the Sal Alembroth of the alchemists. It is very soluble in water, and is sublimed by heat without decomposition. When to a solution of this salt we add a solution of an alkaline carbonate, there occurs a partial decomposition. The alkali combines with a portion of the muriatic acid; and reduces the muriate of mercury and ammonia to the state of a sub-muriate, which, being insoluble, falls to the bottom of the solution.

The sub-muriate of mercury and ammonia thus precipitated, has at first an earthy and afterwards a metallic taste. It is not soluble in water. It is decomposed by heat; furnishing water, ammonia, and nitrogen gas, while 0.86 of sub-muriate of mercury remains behind. Sulphuric and nitric acids partially decompose it, and convert it into muriate of mercury, and triple salts of mercury and ammonia. Muriatic acid dissolves it, and converts it into muriate of quicksilver and ammonia. According to Fourcroy's analysis, it consists of

81 oxide of mercury,
16 muriatic acid,
3 ammonia.

100

Therefore, if the analysis of the different muriates be correct, there is an unnecessary want of economy in using equal parts of muriate of ammonia and muriate of mercury; for by calculation, at least, we should employ only one part of the former to eight of the latter.

It is only used for ointments; and its principal recommendation is its fine white colour.

Off. prep.—Ungt. calcis hydrag. alb. *Lond.*

OXIDUM HYDRARGYRI CINEREM. *Ed.**Ash-coloured Oxide of Quicksilver.*

Take of

Purified quicksilver, four parts;

Diluted nitrous acid, five parts;

Distilled water, fifteen parts;

Water of carbonate of ammonia, a sufficient quantity.

Dissolve the mercury in the nitrous acid; then gradually add the distilled water, and pour into the mixture as much water of the carbonate of ammonia as shall be sufficient to precipitate the whole of the oxide of mercury, which is then to be washed with pure water and dried.

PULVIS HYDRARGYRI CINEREUS. *Dub.**Ash-coloured Powder of Quicksilver.*

Take of

Quicksilver, two ounces;

Diluted nitrous acid, two ounces and a half.

Dissolve the quicksilver with a moderate heat, and dilute the liquor with eight ounces of cold distilled water; then drop into it an ounce and a half of the liquor of mild volatile alkali, or as much as may be sufficient to precipitate the metal, which is to be washed with frequent affusions of warm water, and afterwards dried.

THESE processes, which are essentially the same, are intended to furnish a substitute for the black oxide of quicksilver, on which the efficacy of the mercurials most frequently employed, and most certainly useful, depends. In these, the mercury is oxidized by trituration, in contact with the atmosphere; but this operation is both so tedious and troublesome, that it is often imperfectly performed or assisted by improper means.

In the processes we are now explaining, it was supposed that as ammonia has a stronger affinity for nitric acid than oxide of mercury has, it would separate oxide of mercury from its solution in nitric acid; and, therefore, that the precipitate obtained was oxide of mercury similar to that formed by trituration. But since the nature of the triple metalline salts has been better understood, this has been discovered to be an error, although the exact mode of their action is not yet explained. The grey precipitate which is formed, may, speaking generally, be called a sub-nitrate of mercury and ammonia; for it consists of oxide of mercury and ammonia, not saturated with nitric acid; but even to ocular inspection it does not seem to be homogeneous; and when it is digested in acetic acid, it is partially dissolved, and the residuum re-

quires a very pale, or almost white colour. The portion dissolved seems to be black oxide, and the white residuum to be pure sub-nitrate of mercury and ammonia, which, according to Fourcroy, crystallizes in brilliant polyhedral crystals, without smell, of an extremely styptic taste, scarcely soluble in water, is decomposed by heat, by the sulphuric and muriatic acids, and by lime, potash, and soda, and consists of 68.20 oxide of mercury, 16 of ammonia, and 15.80 of nitric acid. According to these observations, this preparation ought not to be called the grey oxide of mercury, and is not identical with the black oxide of mercury, prepared by trituration. If, however, it answered the same purposes, the identity would be of little consequence; but from its never having been introduced into general use, although so much more easily prepared, we may presume that it is not equal in point of efficacy.

Black oxide of mercury may however be obtained, according to the direction of Saunders, by triturating with lime water, and subsequentedulcoration, the sublimed sub-muriate of mercury, or rather the precipitated sub-muriate, as proposed by Götting; and that the decomposition may be more easy and complete, we shall venture to suggest, that for this preparation the latter sub-muriate should not be dried, but should be triturated with the lime-water as soon as it isedulcorated. This simple black oxide certainly merits a fair trial.

This oxide is said, however, by M. Braamcamp and Siquiera-Oliva, to be prepared in the greatest purity by boiling the ash-coloured oxide of the Edinburgh college, long and violently in water, until the triple salt be dissolved or decomposed. In this state it consists of mercury 92.5, and oxygen 7.5.

The Prussian college direct a black oxide of mercury to be prepared, by mixing four ounces of mercury with six ounces of nitrous acid, diluted with two ounces of distilled water, and occasionally agitating them without heat, until the acid be saturated. The solution is then to be diluted with distilled water, and water of caustic ammonia to be dropt into it as long as the precipitate formed is black.

Off. prep.—Ungt. oxidi hydrarg, cinerei, *Ed.*

HYDRARGYRUS CUM CRETA *Lond.*

Quicksilver with Chalk.

Take of

Purified quicksilver, three ounces;

Prepared chalk, five ounces.

Triturate them together until the globules disappear.

QUICKSILVER has a strong affinity for oxygen, and absorbs it

slowly from the atmosphere. But the combination may be considerably accelerated by agitation, and still more by triturating quicksilver with any substance which promotes its mechanical division, and thus increases its surface. With this view, quicksilver is triturated with viscid substances, as fats, honey, syrup, &c. or with pulverulent substances, as the chalk in the present example.

In this state of oxidizement, quicksilver contains about 0.04 of oxygen according to Fourcroy, is soluble in acids without the extrication of nitrous gas, and is easily reduced by heat, and even by light.

The black oxide is the mildest, but at the same time the most efficacious of the preparations of mercury. Combined with chalk it is not in general use; but in the form of the common mercurial pill and ointment, it is more employed than any other preparations of the same metal except calomel.

HYDRARGYRUM CALCINATUM. *Dub. Lond.*

Calined Quicksilver.

Take of

Purified quicksilver, any quantity.

Put it into an open glass vessel, with a narrow mouth and wide bottom. Expose this to about the six-hundredth degree of heat, until the metal be converted into red scales.

THIS is an extremely tedious, and therefore expensive, operation, because mercury is incapable of absorbing from the atmosphere the quantity of oxygen necessary to convert it into the red oxide, except when in the state of vapour. But as the form of a vessel, which will prevent the dissipation and loss of the mercurial vapour, will at the same time hinder the free access and frequent renewal of the air, the operation can only proceed slowly. The vessel most advantageously employed, is a wide, flat-bottomed matrass, with a very narrow, and almost capillary, neck. Only so much mercury is introduced into it as will cover the bottom of the matrass; and the vessel is not inserted in the sand deeper than the mercury stands within it. A degree of heat is then applied sufficient to cause a gentle ebullition in the mercury, which is thus alternately converted into vapour, and condensed again in the upper part of the vessel. While in the state of vapour, it absorbs the oxygen of the air contained in the vessel: by which means it is gradually changed into a black, and then into a red, powder; but a complete conversion into the latter state is not effected in less than several months.

Red oxide of quicksilver thus prepared, consists of small crystalline grains, of a deep red colour, and very brilliant sparkling

appearance. By heat it may be sublimed in the form of a beautiful ruby-coloured vitrified substance. At a red heat it is decomposed, giving out oxygen gas, while the metal is revived, and is immediately volatilized. It is soluble in several of the acids; and during its solution it does not decompose them or water. It is easily disoxidized. It contains about 0.1 oxygen.

Med. use.—It is not only an acrid substance, violently purgative and emetic, but even caustic and poisonous. Its internal use is proscribed; but it is applied externally as an escharotic, being previously triturated to a very fine powder; or it is formed into a stimulating ointment with unctuous substances.

OXIDUM HYDRARGYRI RUBRUM PER ACIDUM NITRICUM; olim MERCURIUS PRÆCIPITATUS RUBER. *Edin.*

Red Oxide of Quicksilver by Nitric Acid, formerly Red Precipitated Mercury.

Take of

Purified quicksilver, one pound;

Diluted nitrous acid, sixteen ounces.

Dissolve the quicksilver, and evaporate the solution, with a gentle heat, to a dry white mass; which, after being ground into powder, is to be put into a glass cucurbit, and to have a thick glass plate laid upon its surface. Then, having adapted a capital, and placed the vessel in a sand bath, apply a gradually increased heat, until the matter be converted into very red scales.

HYDRARGYRUS NITRATUS RUBER. *Lond.*

Red Nitrated Quicksilver.

Take of

Purified quicksilver,

Nitrous acid, of each one pound;

Muriatic acid, one drachm.

Mix in a glass vessel, and dissolve the quicksilver in a sand bath; then raise the fire until the matter be converted into red crystals.

HYDRARGYRUM SUB-NITRATUM. *Dub.*

Sub-nitrated Quicksilver.

Take of

Purified quicksilver, twenty ounces;

Diluted nitrous acid, twenty-five ounces.

Mix them in a glass vessel, and dissolve the quicksilver with a moderate heat; then increase the fire until the matter be converted into red scales.

In the first part of these processes a fully saturated nitrate of mercury is formed. In the second part, the metal is oxidized to

the maximum by the decomposition of the acid. When a sufficient heat is applied, the nitrate of mercury first melts, then exhales nitrous oxide gas, and changes its colour successively to yellow, orange, and brilliant purple red. If well prepared, it should have a crystalline scaly appearance, sublime entirely at a red heat, and be soluble without any residuum in nitrous acid. According to Fourcroy, it contains no nitrous acid, unless a sufficient heat has not been applied; but according to most other chemists it contains some nitrous acid; and differs from the red oxide prepared by the action of heat alone, in always being more acrid.

This is an extremely difficult operation, and skilful operators not unfrequently fail to obtain it of that brilliant crystalline appearance which is esteemed. M. Payssé, who paid great attention to this preparation in Holland, where it is manufactured in large quantities, gives the following directions. Dissolve 100 pounds of pure mercury in 140 of pure nitrous acid of sp. grav. 1.30 to 1.37, promoting their action by a sand bath, evaporate by distillation, and when the formation of nitrous gas indicates the decomposition of the nitrate of mercury, remove the receiver, and apply a steady and moderate heat for about eight hours, until a match, which has been just blown out inflames on being introduced into the matrafs, which is a proof that the operation is finished. To its success it is necessary, 1, that the nitrous acid be not mixed with muriatic; 2, that it be sufficiently strong; 3, that the evaporation be conducted with a moderate heat; 4, that the vessel be sufficiently large and flat, so that a large surface be exposed, and the whole equally heated; 5, that the heat be gradually augmented; and lastly, that it be steadily maintained the whole time. Turf is the fittest fuel.

Med. use.—It is only used as an escharotic, and care must be taken that it is finely levigated, otherwise it only irritates, without destroying the parts to which it is applied. It is a very common application to chancres.

Off. prep.—Ungt. oxidi hydrarg. rubri, *Ed.*

SUB-SULPHAS HYDRARGYRI FLAVUS; olim TURPETHUM MINERALE. *Edin.*

Yellow Sub-Sulphate of Quicksilver, formerly Turpeth Mineral.

Take of

Purified quicksilver, four ounces;

Sulphuric acid, six ounces.

Put them into a glass cucurbit, and boil them in a sand bath to dryness. Throw into boiling water the white matter, which is left in the bottom, after having reduced it to powder. A yellow powder will immediately be produced, which must be

HYDRARGYRUS VITRIOLATUS. *Lond.* HYDRARGYRUM SUB-VITRIOLATUM. *Dub.*

Vitriolated Quicksilver. Sub-Vitriolated Quicksilver.

Take of

Purified quicksilver, one pound;

Vitriolic acid, fifteen ounces. (A pound and a half. *Dub.*)

Having mixed them in a glass vessel, heat them by degrees until they unite, and dry the matter completely with a strong fire. This matter, on the affusion of a large quantity of hot distilled water, will immediately become yellow, and fall to powder. Rub the powder with this water in a glass mortar. Pour off the water after the powder has subsided, and wash it with distilled water till it becomes insipid, (till, when poured off, it no longer forms any precipitate on the addition of a few drops of mildley. *Dub.*)

THE action of sulphuric acid on mercury has been examined with considerable attention by Fourcroy. In the cold they have no action on each other, but on the application of heat, the sulphuric acid begins to be decomposed, sulphureous acid gas is extricated, and the metal is oxidized, and combines with the undecomposed acid, forming with it a white saline mass, covered with a colourless fluid. In this state it reddens vegetable blues, is acrid and corrosive, does not become yellow by the contact of the air, and is not decomposed by water either warm or cold. It is therefore super-sulphate of quicksilver, and the proportion of the acid in excess is variable.

By washing the saline mass repeatedly with small quantities of water, it is at last rendered perfectly neutral. It no longer reddens vegetable blues. It is white; it crystallizes in plates, or fine prismatic needles; it is not very acrid; it is not decomposed either by cold or boiling water, but is soluble in 500 parts of the former, and in about 250 of the latter. It is much more soluble in water acidulated with sulphuric acid. The sulphate of quicksilver consists

	Fourcroy.	Braamcamp and Sigueira.
Of Quicksilver	75.	57.42
Oxygen	8.	6.38
Sulphuric acid	12.	31.8
Water	5.	4.4
	<hr/> 100.	<hr/> 100.

But if, instead of removing the excess of acid from the super-sulphate of quicksilver, by washing it with water, we continue

the action of the heat according to the directions of the colleges, there is a copious evolution of sulphureous acid gas, and the saline residuum is converted into a white mass, which therefore evidently contains both a larger proportion of mercury, and in a state of greater oxidizement, than the salt from which it was formed. But this white saline mass is farther analysed by the affusion of hot water; for one portion of it is dissolved, while the remainder assumes the form of a beautiful yellow powder. The portion dissolved is said to contain excess of acid. The yellow powder is, on the contrary, a sub-sulphate.

The sub-sulphate of quicksilver has a bright yellow colour, a considerably acrid taste, is soluble in 2000 parts of cold water, is also soluble in sulphuric acid, slightly diluted, is decomposed by the nitric acid, and forms muriate of quicksilver with the muriatic acid, while the neutral sulphate forms sub-muriate. It oxidizes quicksilver, and is converted by trituration with it into a black powder. At a red heat it gives out oxygen gas, and the metal is revived. It consists

	Fourcroy.	Braamcamp and Sigueira.
Of Quicksilver	76.	75.23
Oxygen	11.	8.47
Sulphuric acid	10.	15.
Water	3.	3
	<hr/> 100.	<hr/> 100.

Med. use.—It is a strong emetic, and with this intention operates the most powerfully of all the mercurials that can be safely given internally. Its action, however, is not confined to the primæ viæ; it will sometimes excite a salivation, if a purgative be not taken soon after it. It is used chiefly in virulent gonorrhœas, and other venereal cases, where there is a great flux of humours to the parts. But its chief use at present is in swellings of the testicles from a venereal affection; and it seems not only to act as a mercurial, but also, by the severe vomiting it occasions, to perform the office of a discutient, by accelerating the motion of the blood in the parts affected. It is said likewise to have been employed with success, in robust constitutions, against leprous disorders, and obstinate glandular obstructions: the dose is from two grains to six or eight. It may be given in dozes of a grain or two as an alterative and diaphoretic. Dr. Hope, senior, has found, that in doses of one grain, with a little powder of liquorice root, it forms a very convenient errhine.

This medicine was lately recommended as the most effectual preservative against the hydrophobia.

On the whole, however, we consider it as a superfluous preparation, whose place may be more safely supplied by other mercurials or emetics.

SULPHURETUM HYDRARGYRI NIGRUM; olim *Æthiops MINERALIS.* *Edin.* **HYDRARGYRUS CUM SULPHURE.** *Lond.* **HYDRARGYRUM SULPHURATUM NIGRUM.** *Dub.*
Black Sulphuret of Quicksilver, formerly Æthiops Mineral.

Take of

Purified quicksilver,

Sublimed sulphur, each equal weights.

Grind them together in a glass mortar with a glass pestle, till the mercurial globules totally disappear.

(It is also prepared with twice the quantity of quicksilver. *Ed.*)

THIS process, simple as it appears, is not, even in the present advanced state of chemistry, perfectly understood. It was formerly imagined, that the quicksilver was merely mechanically divided, and intimately mixed with the sulphur. But that they are really chemically united, is indisputably proved by the insolubility of the compound in nitrous acid. Fourcroy is of opinion, that during the trituration, the mercury absorbs oxygen, and is converted into the black oxide, and that in this state it is slightly combined with the sulphur. The editors of Gren also suppose it to be in the state of black oxide, but that it is combined with hydroguretted sulphur; and they direct a little water to be added during the trituration, that by its decomposition it may facilitate the process.

The black sulphuret of quicksilver, thus prepared by trituration, has a pulverulent form, is insoluble in nitric acid, is totally soluble in a solution of potash, and is precipitated unchanged from this solution, by acids. It is not altered by exposure to the air; and when heated in an open vessel, it emits sulphureous acid gas, acquires a dark violet colour, and, lastly, sublimes in a brilliant red mass, composed of crystalline needles.

The combination of quicksilver with sulphur may be much more speedily affected by the assistance of heat, by pouring the mercury, previously heated, upon the sulphur in a state of fusion, and stirring them until they cool, and form a consistent mass, which may be afterwards powdered. The sulphuret prepared by fusion, differs, however, from that prepared by trituration; for it is not soluble in a solution of potash, but is converted by long ebullition in it into the red sulphuret, and it

K k 3

also reddens spontaneously in course of time from the action of the air.

Black sulphuret of mercury may be also prepared in the humid way, as it is called, by precipitation, or even by direct solution. According to Berthollet, mercury agitated with sulphuretted hydroguret of ammonia, forms a black sulphuret exactly resembling that prepared by trituration; but if hydroguretted sulphuret of ammonia be used, the black precipitate formed gradually assumes a red colour, and the solution contains sulphuretted hydroguret of ammonia. The same phenomena take place with all the mercurial salts.

As a medicine, black sulphuret of quicksilver possesses no very conspicuous effects. It is principally used as an alterative in glandular affections, and in cutaneous diseases. It has been commonly given in doses of from 5 to 10 grains; but even in doses of several drachms, and continued for a considerable length of time, it has scarcely produced any sensible effect.

HYDRARGYRUM SULPHURATUM RUBRUM; olim CINNABARIS FACTITIA. *Lond. Dub.*

Red Sulphuretted Quicksilver, formerly Factitious Cinnabar.

Take of

Quicksilver purified, forty ounces;

Sulphur, eight ounces.

Mix the quicksilver with the melted sulphur; and if the mixture takes fire, extinguish it by covering the vessel; afterwards reduce the mass to powder and sublime it.

As soon as the mercury and sulphur begin to unite, a considerable explosion frequently happens, and the mixture is very apt to take fire, especially if the process be somewhat hastily conducted. This accident the operator will have previous notice of, from the matter swelling up, and growing suddenly consistent; as soon as this happens, the vessel must be immediately close covered.

During the sublimation, care must be had that the matter do not rise into the neck of the vessel, so as to block it up and cause it to burst. To prevent this, a wide-necked bolt head, or rather an oval earthen jar, coated, should be chosen for the subliming vessel. If the former be employed, it will be convenient to introduce at times an iron wire, somewhat heated, in order to be the better assured that the passage is not blocking up; the danger of which may be prevented by cautiously raising the vessel higher from the fire.

If the ingredients be pure, there is no residuum. In such cases, the sublimation may be known to be over, by introducing a wire as before, and feeling with it the bottom of the vessel, which will then be perfectly smooth: if any roughness or inequalities be perceived, either the mixture was impure, or the sublimation is not completed; if the latter be the case, the wire will soon be covered over with the rising cinnabar.

M. Tuckert and Payssé have described, from actual observation, the process followed in the manufactory of M. Brand at Amsterdam, where 48000 pounds of cinnabar are annually prepared. 150 pounds of sulphur are mixed with 1080 pounds of mercury, and exposed to a moderate heat in a bright iron kettle, one foot deep, and two and a half in diameter. The black sulphuret of mercury thus produced is reduced to powder, and put up in earthen pots capable of containing about two pints of water. The subliming apparatus consists of three large coated crucibles, bound with iron, and surmounted with domes of iron, through the top of which the black sulphuret is introduced, built into a furnace, so that two thirds of each apparatus is exposed to the action of the flame, which circulates freely around them. The fuel made use of is turf, which is found preferable to all other, probably from its affording a steady and moderate heat. The fire is kindled in the evening, and when the crucibles have become red, the pots containing the black sulphuret are emptied into them successively, at first one into each, and afterwards two, three, or more at a time, according to the violence of the inflammation which succeeds. Sometimes the flame rises four, or even six feet above the domes; when its violence is a little abated, the aperture is covered closely up with a lid of iron. In this manner the whole quantity is introduced into the three crucibles in about thirty-four hours. The fire is steadily supported in a proper degree for thirty-six hours, and the sublimation assisted by stirring the matter every quarter of an hour with a triangle of iron, until the whole is sublimed, when the fire is allowed to expire. The colour of the flame changes during the process from a dazzling white to a yellow white, orange yellow, blue and yellow, green, violet, and blue and green. When it acquires a fine sky blue, or indigo colour, and rises only an inch or two above the aperture, the aperture is closed hermetically, and luted with clay and sand. After the apparatus has cooled, 400 pounds of sublimed red sulphuret of mercury are found in each, so that there is a loss of 30 pounds on the 1230 of materials employed. The process by which cinnabar is converted into vermilion is kept a secret by the Dutch; but M. Payssé discovered, that by keeping some levigated cinnabar in the dark, covered with water, and stirred frequently for a month, it acquires the brilliant colour of Chinese vermilion.

When taken out of the subliming vessels, the red sulphuret of quicksilver is a brilliant crystalline mass, and first acquires its very rich colour when reduced to the form of a fine powder by trituration. It has neither smell nor taste, and is insoluble in water and in alcohol. In close vessels it sublimes entirely unchanged, but requires for this purpose a pretty great degree of heat. It is not soluble in any acid, and is only decomposed by the nitro-muriatic, which dissolves the quicksilver, and separates the sulphur. It is not decomposed by boiling it with solutions of the alkalies, but is decomposed by melting it with potash, soda, lime, iron, lead, copper, antimony, and several other metals. Proust has proved that it consists of eighty-five quicksilver, and fourteen or fourteen and a half sulphur, and that the quicksilver is not oxidized to a maximum, as had been falsely supposed, but is in its metallic state. His analysis is confirmed by the other methods by which cinnabar may be prepared. Thus, the black sulphuret of quicksilver by fusion is converted into the red sulphuret, by boiling it in a solution of potash, which can only act by dissolving the sulphuretted hydrogen and superfluous sulphur. Submuriate, or sub-sulphate of mercury, sublimed with sulphur, furnish red sulphuret of mercury, and muriate, or sulphate, of mercury.

Med use.—Red sulphuret of quicksilver is sometimes used in fumigations against venereal ulcers in the nose, mouth, and throat. By inhaling the fumes produced by throwing half a drachm of it on red hot iron, a violent salivation has been produced. This effect is by no means owing to the medicine as a sulphuret; for when set on fire, it is no longer such, but mercury resolved into vapour, and blended with the sulphureous acid gas; in which circumstances, this mineral has very powerful effects.

Mr. Pearson, from his experiments on mercurial fumigation, concludes, that where checking the progress of the disease suddenly is an object of great moment, and where the body is covered with ulcers, or large and numerous eruptions, and, in general, to ulcers, fungi, and excrescences, the vapour of mercury is an application of great efficacy and utility; but that it is apt to induce a ptyalism rapidly, and great consequent debility, and that for the purpose of securing the constitution against a relapse, as great a quantity of mercury must be introduced into the system by inunction as if no fumigation had been employed.

CHAP. X.

L E A D.

ACETIS PLUMBI; olim SACCHARUM SATURNI. *Edin.*
Acetite of Lead; formerly Sugar of Lead.

Take of

White oxide of lead, any quantity;

Put it into a cucurbit, and pour upon it of

Distilled acetous acid ten times its weight.

Let the mixture stand upon warm sand till the acid becomes sweet, which is then to be poured off, and fresh acid added until it cease to become sweet, then evaporate all the liquor, freed from impurities, in a glass vessel, to the consistence of thin honey, and set it aside in a cold place, that crystals may be formed, which are to be dried in the shade. The remaining liquor is again to be evaporated, that new crystals may be formed; and the evaporation is to be repeated until no more crystals concrete.

CERUSSA ACETATA. *Lond.*
Acetated Ceruse.

Take of

Ceruse, one pound;

Distilled vinegar, one gallon and a half.

Boil the ceruse with the vinegar until the vinegar is saturated; then filter through paper, and, after proper evaporation, set it aside to crystallize.

Dub.

Take of

Ceruse, any quantity;

Distilled vinegar, ten times as much.

Digest in a glass vessel, until the vinegar become sweet. Having poured this off, add more vinegar, until it cease to become sweet. Filter the liquor, and evaporate it slowly, so that it may form crystals, which are to be dried in the shade.

THE acetate of lead is seldom prepared by the apothecary, as he can procure it at an infinitely cheaper rate from those who manufacture it in large quantities. The preparation of it, as directed by the colleges, is a case of simple solution. The process frequently fails, from the oxide of lead employed being adulter-

ated with carbonate of lime, or some other earthy substance. The acetic acid employed, should be as strong as can be procured; for with a weak acid the product of pure salt is small, and the quantity of mother-water is increased. The addition of a small quantity of alcohol to the solution, after it has been duly evaporated, is said to improve the beauty of the crystals. The mother-water, (which probably is essentially the same with Goulard's extract of lead), may also be made to furnish pure crystals, by adding to it a fresh portion of acetic acid; for, without that precaution it furnishes only a very heavy, yellow, pulverulent mass, in which there seems to be an excess of oxide of lead, whereas the crystalized salt is in fact a super-acetate of lead.

The manufacture of acetate of lead is conducted more economically when the oxide is dissolved in the acid at the same time that it is prepared, which is done by alternately exposing plates of lead to the vapour of acetic acid, and immersing the plates, thus covered with oxide, into the acid itself.

Acetate of lead has a sweet styptic taste. It has a white colour, and crystallizes in flat parallelopipeds, terminated by a wedge, or more commonly in shining needles. It is soluble in water and in alcohol; effloresces slightly in the air, and is decomposed by heat and light. It reddens vegetable blues, and is decomposed by the alkalies, and most of the earths and acids.

Medical use.—The internal use of acetate of lead, notwithstanding the encomiums some have been rash enough to bestow upon it, is entirely to be rejected. It forms, however, a very valuable external application in superficial and phlegmonic inflammations, bruises, and diseases of the skin. It is always applied in solution, either simply, as to the eyes, or by means of cloths soaked in it, or mixed with bread-crumbs. A drachm, with five ounces of any distilled water, forms a strong solution, and with ten ounces of water, a weak solution. If common water be used, the addition of about a drachm of acetic acid will be necessary to keep the lead in solution.

Off. prep.—Acid. acetos. forte. *Ed.* Solutio acet. zinci. *Ed.* Ungt. acet. zinci. *Ed. Lond. Dub.*

AQUA LITHARGYRI ACETATI. *Lond.* **LIQUOR LITH. ACET.**; olim **EXTRACTUM SATURNI.** *Dub.*

Water of Acetated Litharge; formerly Extract of Lead.

Take of

Litharge, two pounds and four ounces;

Distilled vinegar, one gallon.

Mix and boil to six pints, constantly stirring, then set it aside.

After the feces have subsided, strain.

Off. prep. *Caratum lith. acet.* *Lond. Dub.*

LIQUOR LITHARGYRI ACETATI COMPOSITUS. *Dub.* AQUA LITH.
ACET. COMPOSITA. *Lond.*

Compound Liquor of Acetated Litharge.

Take of

Liquor of acetated litharge, a drachm ;

Distilled water, fourteen ounces, (one pint, *Lond.*) ;

Weaker spirit of wine, a drachm.

Mix the spirit and liquor of acetated litharge, then add the distilled water.

UNTIL the ingenious experiments of Dr. Bostock, it was believed that these preparations did not differ from solutions of the same strength of acetate of lead, and that they were less proper, as their strength was apt to vary. He has, however, shewn that these conclusions were hasty and inaccurate. By his analysis, it appears that the constituents in the saturated solution of the acetate of lead and of the water of acetated litharge are respectively,

	Former.	Latter.
Oxide of lead,	16.8	23.1
Acetic acid,	7.5	5.
Water,	75.7	71.9
	<hr/> 100.	<hr/> 100. ¹

From this analysis, and the circumstance that the latter does not redden vegetable blues, while the former does, the former, the present acetite of lead of the Edinburgh college, should be named the super-acetate of lead, and the latter the water of acetate of lead. The vitrified oxide of lead made use of in this instance is less easily soluble, on account of its great force of aggregation, than the white oxide ; but, on the other hand, it is less liable to be adulterated. This preparation is a much more delicate test than the solution of the preceding acetate ; but this tendency to decomposition renders the addition of the diluted alcohol necessary, to prevent it, although it also renders it slightly stimulant.

CHAP. XI.

T I N.

STANNI PULVIS. *Lond.*

Powder of Tin.

Take of

Tin, four ounces.

Melt it, and take off the scoriæ, then pour it into a clean iron

vessel. Reduce it to powder, either by agitation or trituration, and pass the fine part of the powder through a hair sieve.

Dub.

Take of

Tin, any quantity.

Having melted it over the fire, agitate it while it is cooling with an iron spatula, until it be reduced to powder, which is to be passed when cold through a sieve.

THE college of Edinburgh do not give this preparation, inserting *Limatura et Pulvis Stanni* in their list of the materia medica.

Medical use.—It is often employed as a remedy against worms, particularly the flat kinds, which too often elude the force of other medicines. The general dose, is from a scruple to a drachm; some confine it to a few grains; but Dr. Alston assures us, in the *Edinburgh Essays*, that its success chiefly depends on its being given in much larger quantities. He directs an ounce of the powder on an empty stomach, mixed with four ounces of molasses; next day, half an ounce; and the day following, half an ounce more; after which, a cathartic is administered. He says the worms are usually voided during the operation of the purge, but that pains of the stomach occasioned by them are removed almost immediately upon taking the first dose of the tin. This practice is sometimes successful in the expulsion of tæniæ, but by no means so frequently as Dr. Alston's observations would lead us to hope.

Blaine's powder, which certainly succeeds sometimes in curing the distemper in dogs, seems to be a sulphuretted oxide of tin.

CHAP. XII.

Z I N C.

OXIDUM ZINCI. *Edin.*

Oxide of Zinc.

Let a large crucible be placed in a furnace filled with live coals, so as to be somewhat inclined towards its mouth; and when the bottom of the crucible is moderately red, throw into it a

small piece of zinc, about the weight of a drachm. The zinc soon inflames, and is at the same time converted into white flakes, which are to be from time to time removed from the surface of the metal with an iron spatula, that the combustion may be more complete; and at last, when the zinc ceases to flame, the oxide of zinc is to be taken out of the crucible. Having put in another piece of zinc, the operation is to be repeated, and may be repeated as often as is necessary. Lastly, the oxide of zinc is to be prepared in the same way as the carbonate of lime.

ZINCUM CALCINATUM. *Lond.**Calcined Zinc.*

Take of

Zinc, broken into pieces, eight ounces.

Throw the zinc at several times into an ignited, large, deep, and inclined crucible, placing over it another crucible, in such a manner that the air may have free access to the burning zinc.

Take out the calx as soon as it appears, and pass its white and lighter part through a sieve.

CALX ZINCI; olim FLORES ZINCI. *Dub.**Calx of Zinc; formerly Flowers of Zinc.*

Take of

Zinc, broken into pieces, any quantity.

Throw it, at different times, into a sufficiently deep crucible, heated red-hot, and placed with its mouth inclined towards the mouth of the furnace. After each time any zinc is thrown in, cover the crucible with another inverted over it, but so that the air may have access to the zinc. Preserve the white and very light calx for use.

THIS is an instance of simple oxidizement. At a red heat, zinc attracts the oxygen of the atmosphere so strongly, that it is quickly covered with a crust of white oxide, which prevents the air from acting on the metal below; and therefore we are desired to operate only on small pieces at a time, and to place the crucible so that we may easily take out the oxide formed, and introduce fresh pieces of zinc. As soon as the crust of oxide is broken or removed the zinc inflames, and burns with a brilliant white or greenish, blue flame, being at the same time converted into very light white flocculi. To save these as much as possible, we are directed to use a very deep and large crucible, and to cover it with an inverted crucible. But as we must not cover it so as to prevent the access of the air, it is doubtful whether the latter precaution be of much service. The greater part of the zinc is, however,

oxidized in the crucible, without being previously converted into vapour; and as this portion of the oxide is always mixed with particles of zinc, it is necessary to separate them by trituration and elutriation.

The oxide thus obtained is of a pure white colour, without smell or taste, infusible and fixed in the fire, insoluble in water or alcohol, and entirely soluble in acids. The presence of lead in it is detected by sulphuric acid, which forms in that case an insoluble sulphate of lead. The white oxide of zinc contains 82.15 zinc, and 17.85 oxygen.

Medical use.—White oxide of zinc is applied externally as a detergent and esiccant remedy. With twice its weight of axunge, it forms an excellent application to deep chops, or excoriated nipples. But besides being applied externally, it has also of late been used internally. In doses from one to seven or eight grains, it has been much celebrated in the cure of epilepsy and several spasmodic affections: and there are sufficient testimonies of their good effects, where tonic remedies in those affections are proper.

Off. prep.—Ungt. oxidi zinci, *Ed.*

CARBONAS ZINCI IMPURUS PRÆPARATUS; olim
LAPIS CALAMINARIS PRÆPARATUS. *Edin.*

Prepared Impure Carbonate of Zinc, formerly Prepared Calamine.

The impure carbonate of zinc, after being roasted by those who make brass, is prepared in the same way as carbonate of lime.

LAPIS CALAMINARIS PRÆPARATUS. *Dub.*
Prepared Calamine.

Reduce calcined calamine to powder, and separate the impalpable parts in the same manner that is directed in the preparation of crabs claws.

Lond.

See the preparation of substances insoluble in water.

As this oxide of zinc is intended for external application, and often to parts very easily irritated, too much pains cannot be bestowed in reducing it to a fine powder.

OXIDUM ZINCI IMPURUM PRÆPARATUM; olim TUT-
TIA PRÆPARATA. *Edin.*

Prepared Impure Oxide of Zinc, formerly Prepared Tutty.

'TUTIA PRÆPARATA. *Lond.*
Prepared Tutty.

See the preparation of substances insoluble in water.

THIS oxide is also prepared for external use only.

SULPHAS ZINCI. *Ed.*
Sulphate of Zinc.

Take of

Zinc, cut into small pieces, three ounces ;

Sulphuric acid, five ounces.

Water, twenty ounces.

Mix them, and when the effervescence is finished, digest the mixture for a little on hot sand ; then strain the decanted liquor through paper, and after proper evaporation set it apart, that it may crystallize.

ZINCUM VITRIOLATUM. *Lond. Dub.*
Vitriolated Zinc.

Take of

White vitriol, one pound ;

Vitriolic acid, one drachm ;

Boiling distilled water, three pints.

Mix and filter through paper. After proper evaporation, set it aside in a cold place to crystallize.

THE sulphate of zinc of commerce is never pure, but always contains iron, copper, and a little lead. From the mode of its preparation, there is also a deficiency of acid and water of crystallization. The means directed for purifying it by the London and Dublin colleges will supply these, but do not separate the foreign metals, except perhaps the lead. If, therefore, a pure sulphate of zinc be wanted, we may, according to the directions of the Edinburgh college, dissolve pure zinc in pure sulphuric acid ; but we believe this process is very rarely practised, especially as the common sulphate of zinc may be sufficiently purified by exposing it in solution to the air, by which means red oxide of iron is precipitated, and by digesting it upon pure zinc, which precipitates the other metals.

Sulphate of zinc crystallizes in tetrahedral prisms terminated by pyramids. It has a metallic styptic taste ; effloresces slowly when exposed to the air. It is soluble in 2.5 parts of water at 60°, and in much less boiling water. It is not soluble in alcohol. It is decomposed by the alkalis and earths, hydroguretted sulphurets, and sulphuretted hydrogurets. It consists of 20 oxide of zinc, 40 acid, and 40 water of crystallization.

Medical use.—Sulphate of zinc, in doses from ten grains to half a drachm, operates almost instantly as an emetic, and is at the same time perfectly safe. It is therefore given, when immediate vomiting is required, as in cases where poison has been swallowed. By employing it internally, in smaller doses, it acts as a tonic; and some think it in every case preferable to the oxide of zinc.

Externally, it is used as a styptic application to stop hæmorrhages; diminish increased discharges, as gonorrhœa; and to cure external inflammations arising from debility and relaxation of the blood-vessels, as in some cases of ophthalmia.

Off. prep.—Solutio sulphat. zinci, *Ed.* Aqua zinci vitrioli cum camph. *Lond.* Aqua alum. comp. *Lond.* Solutio acet. zinci, *Ed.*

SOLUTIO SULPHATIS ZINCI. *Ed.*

Solution of Sulphate of Zinc.

Take of

Sulphate of zinc, sixteen grains;

Water, eight ounces;

Diluted sulphuric acid, sixteen drops.

Dissolve the sulphate of zinc in the water; then, having added the acid, filter through paper.

THE acid is here added to dissolve the excess of oxide of zinc, which the common sulphate often contains. This solution is of a strength proper for injecting into the urethra in gonorrhœa, or applying to the eyes in chronic ophthalmia.

AQUA ZINCI VITRIOLATI CUM CAMPHORA. *Lond.*

Water of Vitriolated Zinc with Camphor.

Take of

Vitriolated zinc, half an ounce;

Camphorated spirit, half an ounce, by measure;

Boiling water, two pints.

Mix and filter through paper.

It is used externally as a lotion for some ulcers, particularly those in which it is necessary to restrain a great discharge. It is also not unfrequently employed as a collyrium in some cases of ophthalmia, where a large discharge of watery fluid takes place from the eyes with but little inflammation; but when it is to be applied to this tender organ, it ought first, at least, to be diluted by the addition of more water.

AQUA ALUMINIS COMPOSITA. *Lond.**Compound Alum Water.*

Take of

Alum,

Vitriolated zinc, of each half an ounce ;

Boiling distilled water, two pints.

Pour the water on the salts in a glass vessel, and strain.

THIS water was long known in our shops, under the title of *Aqua aluminosa Bateana*.

It is used for cleansing and healing ulcers and wounds ; and for removing cataneous eruptions, the part being bathed with it hot three or four times a-day. It is sometimes likewise employed as a collyrium ; and as an injection in gonorrhœa and fluor albus, when not accompanied with virulence.

SOLUTIO ACETITIS ZINCI. *Ed.**Solution of Acetite of Zinc.*

Take of

Sulphate of zinc, one drachm ;

Distilled water, ten ounces.

Dissolve.

Take of

Acetite of lead, four scruples ;

Distilled water, ten ounces.

Dissolve.

Mix the solutions ; let them stand at rest a little, and then filter the liquor.

THIS is a case of double elective attraction, the lead combining and forming an insoluble compound with the sulphuric acid, while the zinc unites with the acetic acid, and remains in solution.

The acetate of zinc may be obtained by evaporation in talcy crystals. It is soluble in water, and is decomposed by heat. It is not poisonous.

When crystallized acetate of lead and sulphate of zinc are triturated together, the mixture presently becomes moist, which is owing to the new compounds combining with less water of crystallization than the original salts, by which means a portion of the water is disengaged in its fluid form.

Med. use.—The solution of acetate of zinc is with many practitioners deservedly much esteemed as an astringent collyrium, and injection.

CHAP. XIII.

*ALCOHOL, ETHER, and ETHEREAL SPIRITS.*ALCOHOL. *Lond.**Alcohol.*

Take of

Rectified spirit of wine, one gallon ;
 Prepared kali, heated, one pound and a half ;
 Pure kali, one ounce.

Mix the vinous spirit with the pure kali, and afterwards add one pound of the hot prepared kali ; shake them, and digest for twenty-four hours. Pour off the spirit, to which add the rest of the prepared kali, and distil in a water bath. It is to be kept in a vessel well stopped. The kali should be heated to 300° Fahrenheit.

The specific gravity of alcohol is to that of distilled water as 815 to 1000.

Dub.

Take of

Rectified spirit of wine, five pounds ;
 Pearl-ashes, dried over the fire, and still warm, one pound ;
 Caustic vegetable alkali, in powder, one ounce.
 Mix the spirit and the caustic alkali ; add the pearl-ashes, previously reduced to powder ; and digest the mixture for three days, frequently agitating it, then pour off the spirit, and distil over three pounds with a moderate heat.

The specific gravity of this spirit is to that of distilled water as 820 to 1000

The theory of these processes has been already explained, and also the superiority of muriate of lime over carbonate of potash for separating the last portions of water from alcohol. The potash is used by the London and Dublin colleges in such small quantity that it can have little effect ; when added in considerable quantity, it acts upon the alcohol itself, and decomposes it, converting it into an ethereal liquor. The Edinburgh college

give no directions for the preparation of a perfectly pure alcohol, as it is never used in pharmacy; but it is perhaps to be regretted, that they have given the title of alcohol to a liquid which is not the alcohol of chemists.

ÆTHER SULPHURICUS. *Ed.*

Sulphuric Ether.

Take of

Sulphuric acid,

Alcohol, each thirty-two ounces.

Pour the alcohol into a glass retort fit for sustaining a sudden heat, and add to it the acid in an uninterrupted stream. Mix them by degrees, shaking them moderately and frequently, and instantly distil from sand previously heated for the purpose, into a receiver kept cool with water or snow. The heat must also be so managed, that the liquor shall boil as soon as possible, and continue to boil till sixteen ounces are drawn off, when the retort is to be removed from the sand.

To the distilled liquor add two drachms of potass, and distil from a very high retort, with a very gentle heat, into a cool receiver, until ten ounces have been drawn off.

Sixteen ounces of alcohol be poured upon the acid remaining in the retort after the first distillation, and the distillation be repeated, more ether will be obtained; and this may be repeated several times.

ÆTHER VITRIOLICUS. *Lond.*

Vitriolic Ether.

Take of

The spirit of vitriolic ether, two pounds by weight;

Water of pure kali, one ounce by measure.

Mix them together, and distil, with a gentle heat, fourteen ounces by measure.

ÆTHER VITRIOLICUS. *Dub.*

Vitriolic Ether.

Take of

Vitriolic ethereal liquor, sixteen ounces;

Caustic vegetable alkali, in powder, two drachms.

Mix them, and distil with a gentle heat ten ounces from a very high retort into a cooled receiver.

ÆTHER SULPHURICUS CUM ALCOHOLE. *Ed.*
Sulphuric Ether with Alcohol.

Take of
 Sulphuric ether, one part ;
 Alcohol, two parts.
 Mix them.

SPIRITUS ÆTHERIS VITRIOLICI. *Lond.*
Spirit of Vitriolic Ether.

Take of
 Rectified spirit of wine,
 Vitriolic acid, each one pound.
 Pour the acid gradually upon the spirit, and mix them by shaking, then distil with a gentle heat, from a retort into a tubulated receiver, to which another recipient is fitted, the spirit of vitriolic ether, till sulphureous vapours begin to rise.
 If another receiver be applied, and the distillation continued, a little oil of wine will be obtained, which is to be preserved for use.

LIQUOR ÆTHEREUS VITRIOLICUS. *Dub.*
Vitriolic Ethereal Liquor.

Take of
 Rectified spirit of wine,
 Sulphuric acid, each thirty-two ounces.
 Put the spirit into a glass retort, capable of supporting a sudden heat, and pour upon it the acid in a continued stream. Mix them gradually, and having placed the retort in sand previously heated, distil the liquor into a cool receiver. But the heat is to be so regulated, that the mixture may boil as soon as possible; and the retort is to be removed from the sand when sixteen ounces have come over.

OLEUM VINI. *Lond.*
Oil of Wine.

Take of
 Alcohol,
 Vitriolic acid, of each one pint.
 Mix them by degrees, and distil; taking care that no black froth pass into the receiver. Separate the oily part of the distilled liquor from the volatile vitriolic acid. To the oily part add as much water of pure kali as is sufficient to correct the sulphur. Then distil off the little ether with a gentle heat.

The oil of wine will remain in the retort, swimming on the watery liquor; from which it is to be separated.

SPIRITUS ÆTHERIS VITRIOLICI COMPOSITUS. *Lond.*
Compound Spirit of Vitriolic Ether.

Take of
 Spirit of vitriolic ether, two pounds;
 Oil of wine, three drachms.

Mix them

LIQUOR ÆTHEREUS OLEOSUS; olim LIQUOR HOFFMANNI ANODYNUS. *Dub.*

Oily Ethereal Liquor, formerly Anodyne Liquor of Hoffman.

Take what remains in the retort after the distillation of the vitriolic ether.

Distil to one half with a moderate heat.

THE products arising from the decomposition of alcohol by the action of the acids are extremely curious and interesting. The theory of their formation was not understood until lately, when it was very ingeniously attempted by Fourcroy and Vauquelin, who endeavour to shew that the acid remains unchanged, and that the alcohol is converted into ether, water, and charcoal.

The most convenient way of mixing the ingredients is to put the alcohol into a tubulated retort, and, with a long tubed funnel reaching down to the bottom of the retort, to pour in the acid. By cautious agitation the two fluids unite, and heat is produced, which may be taken advantage of in the distillation, if we have a sand bath previously heated to the same degree, to set the retort into immediately after the mixture is completed; nor is there any occasion for a tubulated receiver, if we immerse the ordinary receiver, which ought to be large, in water, or bury it in broken ice.

The distillation should be performed with an equal and very gentle heat. The juncture of the retort and recipient is to be luted with a paste made of linseed meal, and further secured by a piece of wet bladder.

Immediately on mixing the acid with the alcohol, there is a considerable increase of temperature, and a slight disengagement of alcohol, somewhat altered, and having an aromatic odour. On placing the retort in the sand bath, a portion of pure alcohol first comes over; and when the mixture in the retort boils, the ether rises, and is condensed in thin, broad, straight streaks, having the appearance of oil. Until the liquor which passes over

into the receiver amounts to about half, or somewhat more than half, of the alcohol operated on, it consists almost entirely of alcohol and ether, and there has been no production of any permanently elastic fluid: but now the product of ether ceases; the sulphuric acid is decomposed; and sulphureous vapours begin to arise, which condense in irregular streaks, or in drops: we must therefore either put a stop to the process, or change the receiver. In the latter case, the products are sulphureous acid, acetic acid, water, and oil of wine, as it was called, accompanied towards the end by a peculiar species of carburetted hydrogen gas, called by the Dutch chemists *Olefiant gas*; because, when mixed with oxygenized muriatic acid, it forms oil. At last the matter in the retort, which has now become thick and black, swells up, and prevents us from carrying the process further.

If we stop the process before the sulphureous vapours arise, the whole acid, diluted with a proportion of water, and mixed with charcoal, remains in the retort; but if we allow the process to go on, there is a continual decomposition of the acid, which is therefore diminished in quantity. In either case, according to Proust, the sulphuric acid may be obtained from the black residuum in the retort, by diluting it with twice its weight of water, filtering it through linen, and evaporating it till it acquire the specific gravity 1.84, then adding about one five-hundredth part of nitrate of potash, and continuing the evaporation until the acid become perfectly colourless, and acquire the specific gravity of 1.86. The residuum, however, may be more advantageously preserved, as the Edinburgh college direct, for preparing more ether, by repeating the process with fresh quantities of alcohol. Proust indeed denies that this residuum is capable of converting more alcohol into ether; but that excellent chemist has somehow fallen into error, for it is a fact, that was known in the time of that no less excellent chemist Dr. Lewis, and inserted in his first edition of this *Dispensatory*, published in 1753, and not a recent discovery of Citizen Cadet, as Fourcroy would lead us to believe. If farther confirmation be wanted, we shall instance Götting, who says, that from three or four pounds of this residuum, he has prepared 60 or 70 pounds of the spirit of vitriolic ether, and more than twelve pounds of vitriolic ether, without rectifying the residuum, or allowing the sulphureous vapour to evaporate. The ether may be separated from the alcohol and sulphureous acid, with which it is always mixed, by re-distilling it with a very gentle heat, after mixing it with potash, or rather lime, which combine with the acid, or with black oxide of manganese, which converts the sulphureous into sulphuric acid, and thus deprives it of its volatility.

Med. use.—The chemical properties of ether have been already

noticed. As a medicine taken internally, it is an excellent antispasmodic, cordial, and stimulant. In catarrhal and asthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of sugar on which ether has been dropt. It is given as a cordial in nausea, and in febrile diseases of the typhoid type; as an antispasmodic, in hysteria, and in other spasmodic and painful diseases; and as a stimulus in soporose and apoplectic affections. Regular practitioners seldom give so much as half an ounce, much more frequently only a few drops, for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. When applied externally, it is capable of producing two very opposite effects, according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat. In this way it is frequently used for removing pains in the head or teeth. On the contrary, if it be dropt on any part of the body, exposed freely to the contact of the air, its rapid evaporation produces an intense degree of cold; and as this is attended with a proportional diminution of bulk in the part to which it is applied, in this way it has frequently facilitated the reduction of strangulated hernia.

The mixture of ether with alcohol, whether prepared directly by mixing them as the Edinburgh college direct, or in the impure state in which it comes over in the first part of the process for distilling ether, the spirit of vitriolic ether of the London, and the vitriolic ethereal liquor of the Dublin, colleges, possesses similar virtues with ether; but in an inferior degree.

Off. Prep.—Tinct. aloes æther, *Ed.* Æth. sulph. cum alc. aromaticus, *Ed.*

SPIRITUS ÆTHERIS NITROSI. *Ed.* LIQUOR ÆTHEREUS NITROSUS. *Dub.*

Spirit of Nitrous Ether. Nitrous Ethereal Liquor.

Take of

Alcohol, three pounds;

Nitrous acid, one pound.

Pour the alcohol into a capacious phial, placed in a vessel full of cold water, and add the acid by degrees, constantly agitating them. Let the phial be slightly covered, and placed for seven days in a cool place; then distil the liquor with the heat of boiling water into a receiver kept cool with water or snow, till no more spirit comes over.

SPIRITUS ÆTHERIS NITROSI. *Lond.**Spirit of Nitrous Ether.*

Take of

Rectified spirit of wine, two pints ;

Nitrous acid, half a pound.

Mix them, by pouring in the acid to the spirit, and distil with a gentle heat one pound ten ounces,

THE action of alcohol and nitrous acid upon each other is much influenced by their proportions. If we use a small proportion of alcohol, or pour alcohol into nitrous acid, there immediately takes place a great increase of temperature, and a violent effervescence and disengagement of red fumes. On the contrary, by placing the phials containing the alcohol and acid, in cold, or rather iced water, they may be mixed, without danger, in the proportions directed by the colleges, and if the acid be added in small quantities at a time, and each portion thoroughly mixed with the alcohol by agitation, I find that no action takes place until heat be applied. It is therefore unnecessary to keep the mixture for seven days, but we may immediately proceed to the distillation, which must be performed with a very slow and well regulated fire ; for the vapour is very apt to expand with so much violence as to burst the vessels ; and the heat must at no time exceed 212° , otherwise a portion of undecomposed acid will pass over and spoil the product. By performing this operation carefully in a Woulfe's apparatus, I got, in the receiver, from three ounces of alcohol, specific gravity 0.841, and one ounce of nitrous acid, two ounces four drachms of spirit of nitrous ether, specific gravity 0.887. Eight ounces of alcohol, contained in the first phial connected with the receiver, gained one drachm and a half, and acquired specific gravity 0.873, and eight ounces of water in the second, 18 grains : the residuum weighed seven drachms and a half. There was therefore a loss of two drachms forty-two grains of permanently elastic fluids. The first portion of these that was examined seemed to be the air of the apparatus : in the next the candle burnt with an enlarged and brightened flame : Was it nitrous oxide ? and all that passed afterwards was a mixture of carbonic acid and the etherized nitrous gas first described by the Dutch chemists. When recently prepared, this gas is inflammable, and does not form red fumes, on coming into contact with atmospheric air : but when attempted to be kept over water, the water becomes acidulous, the gas is diminished in bulk about two thirds, loses its inflammability, and is now converted into red vapour on the admission of atmospheric air. It therefore appears to consist of nitric oxide

gas, holding ether in chemical solution. I have formed a similar gas, by admitting a few drops of ether to nitrous oxide gas over mercury. The Edinburgh and Dublin colleges direct the distillation to be continued till no more spirit comes over. But how is this to be ascertained? After having drawn off about two thirds, according to the directions of the London college, I again applied heat to the retort, and examining the air, which began to come over into the pneumatic apparatus, by carelessly approaching a lighted candle to the extremity of the tube, it kindled, and burst the whole with a violent explosion.

The spirit of nitrous ether thus obtained is a colourless fluid, of a fragrant odour, lighter than water, extremely volatile and inflammable, possessing properties in general analogous to the spirit of sulphuric ether, but of considerably greater specific gravity, striking a deep olive, with a solution of green sulphate of iron, and often, if not always, acid. By age and exposure to the air, it is gradually decomposed, and gives rise to the re-production of more nitrous acid. When this change has taken place, it may be rectified by saturating the acid with lime-water, and redistilling the ethereal fluid. In all probability it is a mixture of nitrous ether and alcohol; for by diminishing the quantity of alcohol employed, we obtain a fluid having a similar relation to the spirit of nitrous ether, that sulphuric ether has to the spirit of sulphuric ether; and by mixing nitrous ether with alcohol, we obtain a fluid exactly resembling spirit of nitrous ether.

When alcohol and nitrous acid are mixed in the proportion necessary for the formation of nitrous ether, the utmost precautions must be taken to diminish their action on each other. Dr. Black contrived a very ingenious method of doing this, by rendering their mixture extremely slow. On two ounces of the strong acid put into a phial, pour slowly and gradually about an equal quantity of water, which, by being made to trickle down the sides of the phial, will float on the surface of the acid without mixing with it; then add, in the same cautious manner, three ounces of alcohol, which, in its turn, will float on the surface of the water. By this means the three fluids are kept separate on account of their different specific gravities, and a stratum of water is interposed between the acid and spirit. The phial containing the spirit must be stopped with a conical stopper, and this stopper confined to its place by a weak spring. The phial is now to be set in a cool place, and the acid will gradually ascend, and the spirit descend, through the water, this last acting as a boundary to restrain their action on each other. When this commences, bubbles of gas rise through the fluids, and the acid gets a blue colour, which it again loses in the course of a few days, at which time a yellow nitrous ether begins to swim on

the surface. As soon as the formation of air-bubbles ceases, it is time to remove the ether formed; for if allowed to remain, its quantity decreases. By this method a quantity of nitrous ether is formed, without the danger of producing elastic vapours or explosion. The residuum of this process is still capable of forming a spirit of nitrous ether, with an additional quantity of alcohol.

By adding the acid to the alcohol in very small quantities, and at considerable intervals, Mr. Dehne procured from two pounds of alcohol, and one pound ten ounces and three drachms of nitrous acid, one pound nine ounces and three drachms of ether: the residuum weighed one pound twelve ounces. There was therefore a loss of five ounces. Mr. Dehne put the alcohol into a tubulated retort, to which a receiver was luted, and poured the acid through the tubulature, and the ether passed over into the receiver, without the application of any heat. The action of the acid on the alcohol did not begin until six ounces and a half were added, and was found to be exhausted, when, on adding more acid, it fell to the bottom in the form of green drops. By using Mr. Dehne's precaution, of adding the acid gradually, I prepared nitrous ether in a Woulfe's apparatus, with perfect ease and safety, although Fourcroy represents it as a most dangerous operation. I introduced the acid gradually through a funnel luted into the tubulature of the retort. The tube of the funnel was very long, and its extremity was immersed in the alcohol in the retort. This simple contrivance not only enabled me to add the acid as I pleased, but also acted as a tube of safety.

There is still another method of forming nitrous ether, which is indeed said to be preferable to those mentioned. It was first practised by M. Voigt. Four pounds of dried nitrate of potash are to be introduced into a tubulated retort, connected with a Woulfe's apparatus; and a mixture of four pounds of sulphuric acid, and three pounds four ounces of alcohol, is to be poured upon it. Without the application of any external heat, nitrous ether passes over into the receiver, and the residuum furnishes, on more alcohol being added to it, spirit of nitrous ether.

When alcohol is converted into ether by the action of nitrous acid, the change produced on it is nearly the same with that produced by sulphuric acid. In the latter case, it is effected by the affinities which form water, and charcoal is precipitated. In the former, it is effected by the affinities which form carbonic acid, and no water is formed.

Nitrous ether seems to differ from sulphuric ether only in being combined with nitric oxide, at least it is highly inflammable, pungent, volatile, and is not soluble in water, while it gives a

deep olive colour to green salts of iron, and has a considerable specific gravity. When simply washed with water, I found it 0.912, when the acid which it evidently contained was removed by saturating it with potash it became 0.896, and when rectified, by re-distilling it, it became 0.866, but recovered decidedly acid properties, probably from the nitric oxide being acidified by the air of the apparatus.

Medical use.—Spirit of nitrous ether has been long deservedly held in great esteem. It quenches thirst, promotes the natural secretions, expels flatulencies, and moderately strengthens the stomach. It may be given in doses of from twenty drops to a drachm, in any convenient vehicle. Mixed with a small quantity of spiritus ammoniæ aromaticus, it proves a mild, yet efficacious, diaphoretic, and often remarkably diuretic; especially in some febrile cases, where such a salutary evacuation is wanted. A small proportion of this spirit added to malt spirits gives them a flavour approaching to that of French brandy.

CHAP. XIV.

HERBARUM et FLORUM EXSICCATIO.

Lond.

THE DRYING OF HERBS AND FLOWERS.

Let these, spread out lightly, be dried by a gentle heat.

Edin.

Herbs and flowers are to be dried by the gentle heat of a stove or common fire, in such quantities at a time, that the process may be finished as quickly as possible; for by this means their powers are best preserved; the test of which is the perfect preservation of their natural colour.

The leaves of hemlock (*conium maculatum*), and of other plants containing a subtil volatile matter, must be immediately reduced to powder, after being dried, and afterwards kept in glass phials well corked.

FURTHER observations on the drying and preservation of simple substances will be found in the Elements of Pharmacy.

SCILLÆ EXSICCATIO. *Lond.**The Drying of Squill.*

Cut the squill, after having removed its dry coats, transversely into thin slices, and dry it by a gentle heat.

SCILLA MARITIMA EXSICCATA. *Ed.**Dried Sea Squill.*

Cut the root of the sea-squill, after having removed its external coat, transversely into thin slices, and dry it by a gentle heat. The sign of its being properly dried is, that although rendered friable, it retains its bitterness and acrimony.

SCILLÆ PRÆPARATÆ. *Dub.**Prepared Squills.*

Cut the squills, after having removed their membranaceous integuments, as thin as possible, and suspend the cut slices in the shade to dry. When dry, reduce them to powder, which is to be kept in a corked phial.

By this method the squill dries much sooner than when its several coats are only separated; the internal part being here laid bare, while, in each of the entire coats, it is covered with a thin skin, which impedes the exhalation of the moisture. The root loses in this process four fifths of its original weight; the parts which exhale with a moderate heat appear to be merely watery: hence six grains of the dry root are equivalent to half a drachm of it when fresh; a circumstance to be particularly regarded in the exhibition of this medicine. But if too great heat has been employed to dry it, it becomes almost inert, and it also loses its virtues by long keeping in the state of powder.

Dried squills furnish us with a medicine, sometimes advantageously employed as an emetic, often as an expectorant, and still more frequently as a powerful diuretic.

MILLIPEDÆ PRÆPARATIO. *Lond.* MILLIPEDÆ PRÆPARATÆ. *Dub.**The Preparation of Millipeds. Prepared Millipeds.*

The millipeds are to be inclosed in a thin canvass cloth, and suspended over hot proof spirit in a close vessel, till they be killed by the steam, and rendered friable.

THIS is the last remains of a justly exploded practice, which ascribed extraordinary virtues to whatever was barbarous and disgusting.

SPONGIÆ USTIO. *Lond.* SPONGIA USTA. *Dub.**The Burning of Sponge. Burnt Sponge.*

Cut the sponge in pieces, and bruise it, so as to free it from small stones; burn it in a close iron vessel, until it becomes black and friable; afterwards reduce it to a very fine powder.

THIS medicine has been in use for a considerable time, and employed against scrofulous disorders and cutaneous foulnesses, in doses of a scruple and upwards. Its virtues probably depend on the presence of a little alkali. It also contains charcoal; and its use may be entirely superseded by these substances, which may be obtained in other manners, at a much cheaper rate.

CHAP. XV.

EXPRESSED JUICES.

THE juices of succulent plants are obtained by expression. They are of a very compound nature, consisting of the sap, the secreted fluids, and fecula, mixed together. When first procured, they are very high-coloured, turbid, and loaded with parenchymatous matter. They may be separated by rest, filtration, heat, and clarification. Rest may be employed when the juice is very fluid, does not contain volatile matter, and is not susceptible of alteration. It is, however, employed with advantage with sub-acid juices, as that of lemons. By rest they undergo a kind of slight fermentation, and all their mucilaginous, and other viscid parts, separate. Filtration is perhaps the most perfect means of defecation, but it is tedious, and applicable only to very fluid juices. In many instances it may be facilitated by the addition of water. The action of heat is more expeditious, and is employed for juices which are very alterable, or which contain volatile matters. It is performed by introducing the juice into a matraass, and immersing it in boiling water for some minutes. The feculæ are coagulated, and easily separated by filtration. Clarification by white of egg can only be used for very viscid mucilaginous juices, which contain nothing volatile. The white of two eggs may be allowed to each pint of juice. They are beat to a fine froth, the juice gradually mixed with them, and

the whole brought to ebullition. The albumen coagulating envelopes all the parenchymatous and feculent matters, and the juice now passes the filter readily. By this process juices are rendered sufficiently fine; but the heat employed deepens their colour, and manifestly alters them, so that it is not merely a defecating, but a decomposing, process. When depurated, juices are yellow or red, but never green.

The fluids thus extracted from succulent fruits, whether acid or sweet, from most of the acrid herbs, as scurvy-grass and water-creffes, from the acid herbs, as sorrel and wood-sorrel, from the aperient lactescent plants, as dandelion and hawkweed, and from various other vegetables, contain great part of the peculiar taste and virtues of the respective subjects. The juices, on the other hand, extracted from most of the aromatic herbs, have scarcely any thing of the flavour of the plants, and seem to differ little from decoctions of them made in water boiled till the volatile odorous parts have been dissipated. Many of the odoriferous flowers, as the lily, violet, hyacinth, not only impart nothing of their fragrance to their juice, but have it totally destroyed by the previous bruising. From want of sufficient attention to these particulars, practitioners have been frequently deceived in the effects of preparations of this class: juice of mint has been often prescribed as a stomachic, though it wants those qualities by which mint itself and its other preparations operate.

There are equal differences in regard to their preserving those virtues, and this independently of the volatility of the active matter, or its disposition to exhale. Even the volatile virtue of scurvy-grass may, by the above method, be preserved almost entire in its juice for a considerable time; while the active parts of the juice of the wild cucumber quickly separate and settle to the bottom, leaving the fluid part inert. Juices of arum root, iris root, bryony root, and other vegetables, in like manner allow their medicinal parts to settle at the bottom.

If juices are intended to be kept for any length of time, about one-fortieth part of their weight of good spirit of wine may be added, and the whole suffered to stand as before; a fresh sediment will now be deposited, from which the liquor is to be poured off, strained again, and put into small bottles which have been washed with spirit and dried. A little oil is to be poured on the surface, so as very nearly to fill the bottles, and the mouths closed with leather, paper, or stopped with straw, as the flasks are in which Florence oil is brought to us: this serves to keep out dust, and suffers the air to escape, which in process of time arises from all vegetable liquors, and which would otherwise endanger the bursting of the glasses; or, being imbibed afresh, render their contents rancid and foul. The bottles are to be kept in the bottom of a

good cellar or vault, placed up to the necks in sand. By this method some juices may be preserved for a year or two; and others for a much longer time, though, whatever care be taken, they are found to answer better when fresh; and from the difficulty of preserving them, they have of late been very much laid aside, especially since we have been provided with more convenient and useful remedies. The following is the only composition of the kind retained in our pharmacopœias.

SUCCUS COCHLEARIÆ COMPOSITUS. *Lond.*

Compound Juice of Scurvy-Grass.

Take of

Juice of Garden scurvy-grass, two pints;
 Brooklime,
 Water-creffes, of each one pint;
 Seville oranges, twenty ounces by measure.

Mix them, and, after the feces have subsided, pour off the liquor, or strain it.

SUCCUS COCHLEARIÆ COMPOSITUS; vulgo, SUCCI AD SCORBUTICOS. *Edin.*

Compound Juice of Scurvy-Grass.

Take of

Juice of Scurvy-grass,
 Water-creffes, expressed from fresh gathered herbs,
 Seville oranges, of each two pounds;
 Spirit of nutmegs, half a pound.

Mix them, and let them stand till the feces have subsided, then pour off the clear liquor.

Both these compositions are of considerable use for the purposes expressed in the title: the orange juice is an excellent assistant to the scurvy-grass, and other acrid antiscorbutics; which, when thus mixed, have been found from experience to produce much better effects than when employed by themselves. They may be taken in doses from an ounce or two to a quarter of a pint, two or three times a-day; they generally increase the urinary secretion, and sometimes induce a laxative habit.

CHAP. XVI.

INSPISSATED JUICES.

THIS is a very convenient form for the exhibition of those substances which are sufficiently succulent to afford a juice by expression, and whose virtues do not reside in any very volatile matter. By inspissation, the bulk of the requisite dose is very much diminished; they are reduced to a form convenient for making up into pills; and they are much less apt to spoil than the simple expressed juices. The mode of their preparation is not yet, however, reduced to fixed principles. Some direct the juices to be inspissated as soon as they are expressed; others allow them previously to undergo a slight degree of fermentation; some defecate them before they proceed to inspissate them, and, lastly, Baumé prepares his elaterium by inspissating the defecated juice of the wild cucumber, while our colleges give the same name to the matter which subsides from it. The nature of the soil, of the season, and many other circumstances, must materially alter the quantity or nature of the product. In moist years Baumé got from thirty pounds of elder berries, four or five pounds of inspissated juice, and in dry years only two, or two and a half. From hemlock he got in October 1769 $\frac{1\frac{1}{2}}{28\cdot5}$ of inspissated juice, and in May of the same year only $\frac{1}{28\cdot5}$; on the contrary, in August 1768 $\frac{1}{21\cdot4}$, and in May 1770 $\frac{1}{15}$, but in general the product in the autumn months was greatest. Hyocianus gave him about $\frac{1}{22}$, and belladonna $\frac{1}{14}$.

SUCCUS SPISSATUS ACONITI NAPELLI. *Ed.**Inspissated Juice of Wolfsbane.*

Bruise the fresh leaves of wolfsbane, and including them in a hempen bag, compress them strongly till they yield their juice, which is to be evaporated in flat vessels heated with boiling water, saturated with muriate of soda, and immediately reduced to the consistence of thick honey.

After the mass has become cold, let it be put up in glazed earthen vessels, and moistened with alcohol.

IN the same manner are prepared from their leaves,

SUCCI SPISSATI

ATROPE BELLADONNE

The Inspissated Juices of

Drosera, Nigella

SUCCI SPISSATI

The Inspissated Juices of

CONII MACULATI,
HYOSCIAMI NIGRI,
LACTUCÆ VIROSÆ,

Hemlock.
Henbane.
Poisonous Lettuce.

SUCCUS SPISSATUS CICUTÆ. *Dub.*

Inspissated Juice of Hemlock.

Express hemlock gathered when the flowers are just appearing, and allow the juice to stand six hours until the feces subside; then reduce the decanted juice to dryness in a water bath.

IN the same way is prepared from fresh gathered berries,

SUCCUS SPISSATUS SAMBUCI. *Dub.*

The Inspissated Juice of Elder-berries.

SUCCUS BACCÆ SAMBUCI SPISSATUS. *Lond.*

Inspissated Juice of the Elder-berry.

Take of

Expressed and depurated juice of elder-berries, two pints.
Inspissate in a water-bath saturated with sea-salt.

IN the same manner inspissate

SUCCUS

The Juice of the

RIBIS NIGRI,
LIMONIS,
CICUTÆ, floribus pri-
mum apparentibus.

Black Currant.
Lemon.
Hemlock, when about to flower.

SUCCUS SPISSATUS SAMBUCI NIGRI; vulgo ROB SAMBUCI. *Ed.*

Inspissated Juice of Elder-berries, commonly called Elder Rob.

Take of

Juice of ripe elder-berries, five pounds;
Double refined sugar, one pound.
Evaporate with a gentle heat to the consistence of pretty thick honey.

These inspissated juices contain the virtues of the respective vegetables in a very concentrated state. Those of the elder, black-currant, and lemon, are acidulous, cooling, and laxative, and may be used in considerable quantities, while those of the wolfsbane, hemlock, deadly nightshade, henbane, and poisonous lettuce, are

highly narcotic and deleterious, and must be given only in very small doses.

Fecula.

SUCCUS SPISSATUS MOMORDICÆ ELATERII; vulgo

ELATERIUM *Ed.* ELATERIUM. *Lond.*

Inspissated Juice of the Wild Cucumber. Elaterium.

Slice ripe wild cucumbers, express the juice very gently, and strain it through a very fine hair sieve, (into a glass vessel, *Lond.*) then boil it a little and set it by for some hours until the thicker part has subsided. The thinner supernatant fluid is to be poured off, and separated by filtering; and the thicker part, which remains after filtration, covered with a linen cloth, and dried with a gentle heat.

THIS is not properly an inspissated juice, but a deposition from the expressed juice. Such depositions have long been called *Fecula*, and the denomination has been confirmed in modern times. Its application, however, appears to us to be too extended; for *fecula* is applied both to mild and nutritious substances, such as starch, and to drastic substances, such as that of which we are now treating. Besides, if it possessed exactly the same chemical properties as starch, it would be converted into a gelatinous mass by the boiling directed by the Edinburgh college, and would not separate; whereas, the boiling is intended to promote the separation.

The filtration above directed, for draining off such part of the watery fluid as cannot be separated by decantation, is not the common filtration through paper, for this does not succeed here: the grosser parts of the juice, falling to the bottom, form a viscid cake upon the paper, which the liquid cannot pass through. The separation is to be attempted in another manner, by draining the fluid from the top. This is effected by placing one end of some moistened strips of woollen cloth, skeins of cotton, or the like, in the juice, and laying the other end over the edge of the vessel, so as to hang down lower than the surface of the liquor: by this management the separation succeeds in perfection.

Med. use.—*Elaterium* is a very violent hydragogue cathartic. In general, previous to its operation, it excites considerable sickness at stomach, and frequently produces severe vomiting. It is therefore seldom employed till other remedies have been tried in vain. But in some instances of ascites it will produce a complete evacuation of water, where other cathartics have had no effect. Two or three grains are in general a sufficient dose, although perhaps the best mode of exhibiting it is by giving it only to the

extent of half a grain at a time, and repeating that dose every hour till it begins to operate.

Pulps.

PULPARUM EXTRACTIO. *Ed. Dub.*

The Extraction of Pulps.

Boil unripe pulpy fruits, and ripe ones if they be dry, in a small quantity of water until they become soft; then press out the pulp through a hair sieve, and afterwards boil it down to the consistence of honey in an earthen vessel, over a gentle fire; taking care to keep stirring the matter continually, to keep it from burning.

(The pulp of cassia fistularis is in like manner to be boiled out from the bruised pod, and reduced afterwards to a proper consistence, by evaporating the water.

The pulps of fruits that are both ripe and fresh, are to be expressed through the sieve, without any previous boiling. *Ed.*)

PULPARUM PRÆPARATIO. *Lond.*

The Preparation of Pulps.

Set pulpy fruits, if they be unripe, or ripe and dry, in a moist place, that they may become soft, then press the pulps through a hair sieve; afterwards boil them first with a gentle heat, and stir them frequently, then evaporate the water in a water bath, saturated with sea salt, until the pulps acquire the proper consistency.

Pour boiling water on the bruised pods of the cassia fistularis, so as to wash out the pulp; then press the matter first through a coarse sieve, and afterwards through a hair sieve; lastly, evaporate the moisture in a water bath, saturated with sea salt, so as to reduce the pulp to a proper consistency.

Express the pulps of ripe recent fruits through a sieve, without boiling them.

WHEN these fruits are not sufficiently juicy to afford a pulp by simple expression, the decoction ordered by the Edinburgh and Dublin colleges is much more certain, and in every respect preferable to exposing them to a moist air, which is not only often inefficient, but is apt to render them spoilt and mouldy. On the other hand, the precaution used by the London college, of finishing the evaporation in a water bath, is highly proper, as otherwise they are extremely apt to become empyreumatic.

The pulps expressed from recent substances without coction, are

less mucilaginous, are more apt to allow their fluid parts to separate when left at rest, than when they have been previously boiled; and very succulent vegetables, such as apples, pears, and lily roots, may be roasted in hot ashes instead of being boiled.

CHAP. XVII.

FIXED OILS.

THESE oils are commonly denominated Expressed oils, an appellation which is manifestly improper, as in some instances they are obtained without expression, and in other instances expression is employed to obtain volatile oils. The Edinburgh college have therefore distinguished these different classes of oils by the terms Fixed and Volatile, which accurately characterize them.

Fixed oil is formed in no other part of vegetables than in their seeds. Sometimes, although very rarely, it is contained in the parenchyma of the fruit. Of this the best known example is the olive. But it is most commonly found in the seeds of dicotyledonous vegetables, sometimes also in the fruit of monocotyledonous plants, as the *cocos butyracea*. It has various degrees of consistency, from the tallow of the *croton sebiferum* of China, and the butter of the butter-tree of Africa, to the fluidity of olive oil.

Fixed oils are either

1. Fat, easily congealed, and not inflammable by nitric acid, oil of olives, almonds, rapeseed, and ben.
2. Drying, not congealable, inflammable by nitric acid, oil of linseed, nut, and poppy.
3. Concrete oils, palm oil, &c.

Fixed oil is separated from fruits and seeds which contain it, either by expression or decoction. Heat, by rendering the oil more limpid, increases very much the quantity obtained by expression; but as it renders it less bland, and more apt to become rancid, heat is not used in the preparation of oils which are to be employed in medicine. When obtained by expression,

oils often contain a mixture of mucilage, starch, and colouring matter; but part of these separate in course of time, and fall to the bottom. When oils become rancid, they are no longer fit for internal use, but are then said to effect the killing of quicksilver, as it is called, more quickly. Decoction is principally used for the extraction of the viscid and consistent oils, which are melted out by the heat of the boiling water, and rise to its surface.

Those who prepare large quantities of the oil of almonds, blanch them, by steeping them in very hot water, which causes their epidermis to swell and separate easily. After they peel them, they dry them in a stove, then grind them in a mill like a coffee mill, and lastly, express the oil from the paste inclosed in a hempen bag. By blanching the almonds, the paste which remains within the bag is sold with greater advantage to the perfumers, and the oil obtained is perfectly colourless. But the heat employed disposes the oil to become rancid, and the colour the oil acquires from the epidermis does not injure its qualities. For pharmaceutical use, therefore, the almonds should not be blanched, but merely rubbed in a piece of coarse linen, to separate as much as possible, the brown powder adhering to the epidermis. Sixteen ounces of sweet almonds commonly give five ounces and a half of oil. Bitter almonds afford the same proportion, but the oil has a pleasant bitter taste.

OLEUM AMYGDALÆ COMMUNIS. *Edin.*

Almond Oil.

Take of

Fresh almonds, any quantity.

After having bruised them in a stone mortar, put them into a hempen bag, and express the oil without heat.

IN the same manner is to be expressed from its seeds,

OLEUM LINI USITATISSIMI. *Oil of Linseed.*

OLEUM AMYGDALÆ. *Lond.*

Almond Oil.

Pound fresh almonds, either sweet or bitter, in a mortar, then press out the oil in a cold press.

IN the same manner are to be expressed,

OLEUM LINI, *Linseed Oil, from the bruised seeds.*

OLEUM RICINI, *Castor Oil*, from the seeds previously decorated.

OLEUM SINAPEOS, *Oil of Mustard*, from the bruised seeds.

OLEUM AMYGDALARUM. *Dub.*
Oil of Almonds.

Bruise fresh almonds in a mortar, and express the oil in a press without heat.

IN the same way are to be expressed from the seeds,

OLEUM LINI, *Linseed Oil.*

OLEUM SINAPIS, *Oil of Mustard.*

The chemical properties of these oils have been already mentioned, and an account of the medical virtues of each will be found in their respective places in the *Materia medica*.

CHAP. XVIII.

OILY PREPARATIONS.

OLEUM AMMONIATUM, vulgo LINIMENTUM VOLATILE.
Ed.

Ammoniated Oil, commonly called *Volatile Liniment*.

Take of

Olive oil, two ounces ;

Water of ammonia, two drachms.

Mix them together.

LINIMENTUM AMMONIÆ FORTIUS. *Lond.*
Stronger Liniment of Ammonia.

Take of

Water of pure ammonia, one ounce ;

Olive oil, two ounces.

Shake them together in a phial.

LINIMENTUM AMMONIÆ. *Lond.**Liniment of Ammonia.*

Take of

Water of ammonia, half an ounce ;

Olive oil, one ounce and a half.

Shake them together in a phial till they are mixed.

THE most commonly adopted generic name for the combination of oil with alkalies is Soap, and the species are distinguished by the addition of that of the alkali they contain. On these principles, volatile liniment should be called Soap of Ammonia, as hard soap is soap of soda, and soft soap, soap of potash.

The ammonia used in the two first of these preparations combines much more easily and intimately with the oil than the carbonate of ammonia used in the last. If the carbonate be employed with the view of rendering the preparation less stimulating, the same end will be more scientifically obtained, by increasing the proportion of oil mixed with pure ammonia. The two first of these liniments differ greatly in point of strength, the proportion of water of ammonia in the first, being as 1 to 8, and in the second as 1 to 2.

Med. use.—They are frequently used externally as stimulants and rubefacients. In inflammatory sore throats, a piece of flannel moistened with these soaps, applied to the throat, and renewed every four or five hours, is one of the most efficacious remedies. By means of this warm stimulating application, the neck, and sometimes the whole body, is put into a sweat, which, after bleeding, either carries off, or lessens the inflammation. When too strong, or too liberally applied, they sometimes occasion inflammations, and even blisters. Where the skin cannot bear their acrimony, a larger proportion of oil may be used.

But the first of these preparations is even sometimes used internally, made into a mixture with syrup and some aromatic water. A drachm or two taken in this manner, three or four times a-day, is a powerful remedy in some kinds of catarrh and sore throat.

LINIMENTUM AQUÆ CALCIS, sive OLEUM LINI
CUM CALCE. *Ed.**Liniment of Lime Water, or Linseed Oil with Lime.*

Take of

Linseed oil,

Lime water, of each equal parts.

Mix them.

THIS liniment is extremely useful in cases of scalds or burns,

being singularly efficacious in preventing, if applied in time, the inflammation subsequent to these; or even in removing it, after it has come on.

It is also a species of soap, and might be called Soap of Lime, although it probably contains a great excess of oil.

OLEUM CAMPHORATUM. *Ed.*

Camphorated Oil.

Take of

Olive oil, two ounces;

Camphor, half an ounce.

Mix them so that the camphor may be dissolved.

THIS is a simple solution of camphor in fixed oil, and is an excellent application to local pains from whatever cause, and to glandular swellings.

OLEUM SULPHURATUM. *Ed.*

Sulphuretted Oil.

Take of

Olive oil, eight ounces;

Sublimed Sulphur, one ounce.

Boil them together in a large iron pot, stirring them continually, till they unite.

Lond.

Take of

Flowers of sulphur, four ounces.

Olive oil sixteen ounces, by weight.

Boil the flowers of sulphur, with the oil, in a pot slightly covered, until they be united.

GÖTTLING directs the oil to be heated in an iron pot, and the sulphur to be gradually added, while the solution is promoted by constant stirring with an iron spatula. The pot must be sufficiently large, as the mixture swells and boils up very much; and as it is apt to catch fire, a lid should be at hand to extinguish it by covering up the pot.

Medical use.—Sulphuretted oil was formerly strongly recommended in coughs, consumptions, and other disorders of the breast and lungs: but the reputation which it had in these cases, does not appear to have been derived from any fair trial or experience. It is manifestly hot, acrimonious, and irritating; and should therefore be used with the utmost caution. It has frequently been found to injure the appetite, offend the stomach and viscera, parch the body, and occasion thirst and febrile heats. The dose

of it is from ten to forty drops. It is employed externally for cleansing and healing foul running ulcers; and Boerhaave conjectures, that its use in these cases gave occasion to the virtues ascribed to it when taken internally.

Off. prep.—Emplast. ammon. cum hydrarg. *Lond.* Emp. lith. cum hyd. *Lond.*

PETROLEUM SULPHURATUM. *Lond.*

Sulphuretted Petroleum,

Is prepared in the same way as sulphuretted oil.



CHAP. XIX.

DISTILLED WATERS.

SUBSTANCES which differ in volatility, may be separated from each other by applying a degree of heat capable of converting the most volatile into vapour, and by again condensing this vapour in a proper apparatus. Water is converted into vapour at 212° , and may be separated by distillation from the earthy and saline matters which it always contains in a natural state. But, it is evident, that if any substances which are as volatile as water, be exposed to the same degree of heat, either by immersing them in boiling water, or exposing them to the action of its steam, they will rise with it in distillation. In this way the camphor and volatile oils of vegetable substances are separated from the more fixed principles; and as water is capable of dissolving a certain quantity of these volatile substances, it may be impregnated with a great variety of flavours by distilling it from different aromatic substances. If the subject of our distillation contain more volatile oil than the water employed is capable of dissolving, it will render the water milky, and afterwards separate from it. It is in this way that volatile oils are obtained.

Volatile oils are obtained only from odoriferous substances; but not equally from all of this class, nor in quantity proportional to their degree of odour. Some, which, if we were to reason from analogy, should seem very well fitted for this process, yield extremely little oil, and others none at all. Roses and chamom-

mile flowers, whose strong and lasting smell promises abundance, are found to contain but a small quantity of oil: the violet and jessamine flower, which perfume the air with their odour, lose their smell upon the gentlest coction, and do not afford any oil on being distilled, unless immense quantities are submitted to the operation at once; while savin, whose disagreeable scent extends to no great distance, gives out the largest proportion of volatile oil of almost any vegetable known.

Nor are the same plants equally fit for this operation, when produced in different soils or seasons, or at different times of their growth. Some yield more oil if gathered when the flowers begin to fall off than at any other time. Of this we have examples in lavender and rue; others, as sage, afford the largest quantity when young, before they have sent forth any flowers; and others, as thyme, when the flowers have just appeared. All fragrant herbs yield a larger proportion of oil, when produced in dry soils and in warm summers, than in opposite circumstances. On the other hand, some of the disagreeable strong-scented ones, as wormwood, are said to contain most oil in rainy seasons, and when growing in moist rich grounds.

Several chemists have been of opinion, that herbs and flowers, moderately dried, yield a greater quantity of volatile oil, than if they were distilled when fresh. It is, however, highly improbable, that the quantity of volatile oil will be increased by drying; on the contrary, part of it must be dissipated and lost. But drying may sometimes be useful in other ways; either by diminishing the bulk of the subject to be distilled, or by causing it to part with its oil more easily.

The choice of proper instruments is of great consequence for the performance of this process to advantage. There are some oils which pass freely over the swan-neck of the head of the common still: others, less volatile, cannot easily be made to rise so high. For obtaining these last, we would recommend a large low head, having a rim or hollow canal round it: in this canal, the oil is detained in its first ascent, and thence conveyed at once into the receiver, the advantages of which are sufficiently obvious.

With regard to the proportion of water to be employed; if whole plants, moderately dried, are used, or the shavings of woods, as much of either may be put into the vessel as, lightly pressed, will occupy half its cavity; and as much water may be added as will fill two thirds of it. When fresh and juicy herbs are to be distilled, thrice their weight of water will be fully sufficient; but dry ones require a much larger quantity. In general, there should be so much water, that after all intended to be distilled has come over, there may be liquor enough left to prevent the matter from burning to the still. The water and ingredients, alto-

gether, should never take up more than three fourths of the still; there should be liquor enough to prevent any danger of any empyreuma, but not so much as to be apt to boil over into the receiver.

The subject of distillation should be macerated in the water until it be perfectly penetrated by it. To promote this effect, woods should be thinly shaved across the grain, or sawn, roots cut transversely into thin slices, barks reduced into coarse powder, and seeds slightly bruised. Very compact and tenacious substances require the maceration to be continued a week or two, or longer; for those of a softer and looser texture, two or three days are sufficient; while some tender herbs and flowers not only stand in no need of maceration, but are even injured by it. The fermentation which was formerly prescribed in some instances, is always hurtful.

With regard to the fire, the operator ought to be expeditious in raising it at first, and to keep it up during the whole process, to such a degree only, that the oil may freely distil; otherwise the oil will be exposed to an unnecessary heat; a circumstance which ought as much as possible to be avoided. Fire communicates to all these oils a disagreeable impregnation, as is evident from their being much less grateful when newly distilled, than after they have stood for some time in a cool place: and the longer the heat is continued, the greater alteration it produces in them.

The greater number of oils require for their distillation the heat of water strongly boiling: but there are many also which rise with a heat considerably less; such as those of lemon and citron peel; of the flowers of lavender and rosemary, and of almost all the more odoriferous kinds of flowers. We have already observed, that these flowers have their fragrance much injured, or even destroyed, by beating or bruising them; it is impaired also by the immersion in water in the present process, and the more so in proportion to the continuance of the immersion and the heat; hence oils, distilled in the common manner, prove much less agreeable in smell than the subjects themselves. For the distillation of substances of this class, another method has been contrived; instead of being immersed in water, they are exposed only to its vapour. A proper quantity of water being put into the bottom of the still, the odoriferous herbs or flowers are laid lightly in a basket, of such a size that it may enter into the still, and rest against its sides, just above the water. The head being then fitted on, and the water made to boil, the steam, percolating through the subject, imbibes the oil, without impairing its fragrance, and carries it over into the receiver. Oils thus obtained, possess the odour of the subject in an exquisite degree, and

have nothing of the disagreeable scent perceivable in those distilled by boiling them in water in the common manner.

Plants differ so much, according to the soil and season of which they are the produce, and likewise according to their own ages, that it is impossible to fix the quantity of water to be drawn from a certain weight of them to any invariable standard. The distillation may always be continued as long as the liquor runs well flavoured off the subject, but no longer.

In the distillation of volatile oils, the water, as was observed in a foregoing section, imbibes always a part of the oil. The distilled liquors here treated of, are no other than water thus impregnated with the essential oil of the subject; whatever smell, taste, or virtue, is communicated to the water, or obtained in the form of watery liquor, being found in a concentrated state in the oil.

All those vegetables, therefore, which contain an essential oil, will give over some virtue to water by distillation: but the degree of the impregnation of the water, or the quantity of water which a plant is capable of saturating with its virtue, are by no means in proportion to the quantity of its oil. The oil saturates only the water that comes over at the same time with it: if there be more oil than is sufficient for this saturation, the surplus separates, and concretes in its proper form, not miscible with the water that arises afterwards. Some odoriferous flowers, whose oil is in so small quantity, that scarcely any visible mark of it appears, unless fifty or an hundred pounds or more are distilled at once, give nevertheless as strong an impregnation to water as those plants which abound most with oil.

Many have been of opinion, that distilled waters may be more and more impregnated with the virtues of the subject, and their strength increased to any assigned degree, by *cobobation*, that is, by re-distilling them repeatedly from fresh parcels of the plant. Experience, however, shews the contrary. A water skilfully drawn in the first distillation, proves on every repeated one not stronger but more disagreeable. Aqueous liquors are not capable of imbibing above a certain quantity of the volatile oil of vegetables; and this they may be made to take up by one, as well as by any number of distillations: the oftener the process is repeated, the ungrateful impression which they generally receive from the fire, even at the first time, becomes greater and greater.

Those plants, which do not yield at first waters sufficiently strong, are not proper subjects for this process.

The mixture of water and oil which comes over, may either be separated immediately by means of a separatory, or after it has been put into large narrow-necked bottles, and placed in a cool

place, that the portion of oil which is not dissolved in the water may rise to the top, or sink to the bottom, according to its specific gravity. It is then to be separated, either by a separatory, (Plate I, fig. 10); or by means of a small glass syringe; or by means of a filter of paper; or, lastly, by means of a woollen thread, one end of which is immersed in the oil, and the other lower end in a phial: the oil will thus pass over into the phial by capillary attraction, and the thread is to be squeezed dry.

Most distilled waters, when first prepared, have a somewhat unpleasant smell, which however they gradually lose: it is therefore advisable to keep them for some days after their preparation in vessels but slightly covered; and not to cork them up until they lose that smell.

That the waters may keep the better, about one twentieth part their weight of proof spirit may be added to each after they are distilled. I have been informed by a respectable apothecary, that if the simple distilled waters be rectified by distilling them a second time, they will keep for several years without the addition of any spirit, which always gives an unpleasant flavour, and is often objectionable for other reasons.

Distilled waters are employed chiefly as grateful diluents, as suitable vehicles for medicines of greater efficacy, or for rendering disgusting ones more acceptable to the palate and stomach: few are depended on, with any intention of consequence, by themselves.

To the chapter on Simple Distilled Waters, the London college have annexed the following remarks.

WE have ordered most of the waters to be distilled from the dried herbs, because fresh are not ready at all times of the year. Whenever the fresh are used, the weights are to be increased. But, whether the fresh or dried herbs be employed, the operator may vary the weight according to the season in which they have been produced and collected.

Herbs and seeds kept beyond the space of a year, become less proper for the distillation of waters.

To every gallon of these waters add five ounces, by measure, of proof spirit.

The Edinburgh college order half an ounce of proof spirit to every pound of the water, which is nearly the same.

AQUA DISTILLATA. *Lond.*
Distilled Water.

Take of

Spring water, ten gallons.

Draw off by distillation, first, four pints; which being thrown away, draw off four gallons. This water is to be kept in a glass or earthen bottle, with a glass stopper.

Dub.

Take of

Spring water, twenty pounds.

Put it into a retort, and having thrown away the first pound, draw off ten pounds by distillation with a gentle heat.

Edin.

Let water be distilled in very clean vessels, until about two thirds have come over.

WATER is never found pure in a state of nature; and as it is absolutely necessary, particularly for many chemical operations, that it should be perfectly so, we must separate it from all heterogeneous matters by distillation. The first portion that comes over should be thrown away, not so much from the possibility of its being impregnated with volatile matters contained in the water, as from the probability that it will be contaminated with impurities it may have contracted in its passage through the worm in the refrigeratory. The distillation is not to be pushed too far, lest the water should acquire an empyreumatic flavour.

Although distilled water be necessary for many purposes, we apprehend that the London college, from a desire of extreme elegance, have fallen into a very considerable error in ordering it to be employed for many purposes, such as infusions and decoctions, for which good spring water would answer just as well, and for which, we will venture to say, that it never is employed by the apothecary. The consequence is, that the apothecary has no rule to direct him, when it is absolutely necessary, and when it may be dispensed with, and he will therefore probably dispense with it oftener than is proper.

AQUA CITRI AURANTII. *Edin.*
Orange-Peel Water.

Take of

Fresh orange-peel, two pounds.

Pour upon it as much water as shall be sufficient to prevent any empyreuma, after ten pounds have been drawn off by distillation.

AQUA FOENICULI DULCIS. *Dub. Lond.*

Fennel Water.

Take of

The bruised seeds of sweet fennel, one pound;

Water, as much as may be sufficient to prevent empyreuma.

Distil one gallon (ten pounds, *Dub.*)

In the same quantity, and in the same manner, is to be distilled

ROSE WATER,

From six pounds of the { *Aqua Rosæ Centifoliæ.* *Edin.*

recent petals, { *Aqua Rosæ.* *Lond. Dub.*

Off. prep.—Ungt. adipis suill. *Lond.*

PEPPERMINT WATER,

From three pounds, { *Aqua Menthe Piperitæ.* *Edin.*

From one pound and a half, { *Aqua Menthe Piperitidis.* *Lond. Dub.*

PENNYROYAL WATER,

From three pounds in flower, *Aqua Menthe Pulegii.* *Edin.*

From one pound and a half, *Aqua Pulegii.* *Lond. Dub.*

LEMON PEEL WATER,

Two pounds, *Aqua Citri Medicæ.* *Edin.*

SPEARMINT WATER,

One pound and a half, *Aqua Menthe Sativæ.* *Dub. Lond.*

CINNAMON WATER,

From one pound bruised, *Aqua Lauri Cinnamoni.* *Edin.*

Do. macerated for a day, *Aqua Cinnamoni.* *Lond. Dub.*

CASSIA WATER,

One pound of bruised, *Aqua Lauri Cassiæ.* *Edin.*

DILL WATER,

One pound bruised, *Aqua Anethi.* *Lond.*

PIMENTO WATER,

Half a pound bruised, *Aqua Myrti Pimentæ.* *Edin.*

Macerated for a day, *Aqua Pimento.* *Lond.*

THE virtues of all these waters are nearly alike; and the peculiarities of each will be easily understood by consulting the account given in the *Materia medica* of the substance from which they are prepared. Mr. Nicholson mentions, that as rose water is exceedingly apt to spoil, the apothecaries generally prepare it in small quantities at a time from the leaves, preserved by packing them closely in cans with common salt. This we understand is

not the practice in Edinburgh; and indeed cannot succeed with the petals of the damask rose, for they lose their smell by drying. The London apothecaries, therefore, probably use the red rose. The spoiling of some waters is owing to some mucilage carried over in the distillation; for, if rectified by a second distillation, they keep perfectly.

CHAP. XX.

VOLATILE OILS.

OLEA VOLATILIA. *Edin.* *Volatile Oils.*

VOLATILE OILS are prepared nearly in the same manner as the distilled waters, except that less water is to be added. Seeds and woody substances are to be previously bruised or rasped. The oil comes over with the water, and is afterwards to be separated from it, according as it may be lighter than the water, and swim upon its surface, or heavier, and sink to the bottom.

Besides, in preparing these distilled waters and oils, it is to be observed, that the goodness of the subject, its texture, the season of the year, and similar causes, must give rise to so many differences, that no certain or general rule can be given to suit accurately each example. Therefore, many things are omitted, to be varied by the operator according to his judgment, and only the most general precepts are given.

OLEA DISTILLATA. *Lond.* *Distilled Oils.*

Let these oils be drawn off by distillation, from an alembic with a large refrigeratory; but, to prevent empyreuma, water must be added to the ingredients; in which they must be macerated before distillation.

The water which comes over with the oil in distillation is to be kept for use.

Dub.

Let the oil be extracted by distillation from the subject previously macerated in water, with the addition of as much water as may

In distilling fennel, peppermint, spearmint, and pennyroyal, the water which comes over along with the oil is to be preserved for use in the manner directed in the chapter on Distilled Waters.

The herbs from which oils are to be extracted by distillation, are to be dried as soon as they are collected.

According to these directions, are prepared the
 Volatile, Distilled, or } { *OLEA Volatilia*, Edin. *Distillata*,
 Essential, OILs of } { Dub. *vel Essentialia*, Lond.

Anise, { *Pimpinella anisi*. Edin.
 { *Anisi*. Lond. Dub.
Off. prep.—Tinct. opii ammon. *Ed.* Tinct. opii camph. *Lond.*
Dub.

Caraway, *Carui*. Lond. Dub.
Off. prep. Elect. fennæ, *Dub.* Elect. scammon. *Lond. Dub.*
Pil. aloet, Lond.
 Fennel seeds, *Seminum fœniculi dulcis*. Dub.

from the Seeds.

Juniper berries, { *Juniperi communis*. Edin.
 { *Baccarum juniperi*. Dub.
 { *Juniperi Bacca*. Lond.

from the Berries.

Pimento, *Myrti pimentæ*. Edin.

from the Fruit.

Fennel flowers, *Florum fœniculi dulcis*. Dub.
 Rosemary, { *Rorismarini officinalis*. Edin.
 { *Rorismarini*. Lond. Dub.
Off. prep.—Tinct. sapon. *Ed.* Linim sapon. *Dub.* Alcohol amm.
rom. Ed.

Lavender, { *Lavandula spica*. Edin.
 { *Lavandulæ*. Lond.

Off. prep.—Ungt. sulph. *Ed.*

Peppermint, *Mentha piperita*. Edin.
 ——— *piperitidis*. Lond. Dub.

Off. prep.—Pil rhœi comp. *Ed.*

Spearmint, *Mentha sativæ*. Lond. Dub.

Off. prep.—Ungt. lad. comp. *Lond.*

Pennyroyal, *Pulegii*. Lond. Dub.

Origanum, *Origani*. Lond. Dub.

Rue, *Rutæ*. Dub.

Savine, $\left\{ \begin{array}{l} \text{Juniperi sabina. Ed.} \\ \text{Sabina. Dub.} \end{array} \right.$

from the Flower, or Herb in flower. And of

Sassafras, $\left\{ \begin{array}{l} \text{Lauri sassafras. Edin.} \\ \text{Sassafras. Lond.} \end{array} \right.$

from the Root.

OLEUM TEREBINTHINÆ. Lond. Dub.
Oil of Turpentine.

Take of

Common turpentine, five pounds.

Water, four pints, (four pounds, *Dub.*)

Distil (two pounds, *Dub.*) (the turpentine with the water in a copper alembic, *Lond.*) After the distillation of the oil, what remains, in the retort, is yellow resin.

OLEUM VOLATILE PINI PURISSIMUM; olim OLEUM
TEREBINTHINÆ PURISSIMUM. Edin. OLEUM TEREBINTHINÆ
RECTIFICATUM. Lond. Dub.

Rectified Oil of Turpentine.

Take of

Oil of turpentine, one pound, (two pounds, *Dub.*);

Water, four pints, (four pounds, *Dub.*)

Distil (a pound and a half, *Dub.*) (as long as any oil comes over, *Edin.*)

This process is both tedious and accompanied with danger. It must be conducted with very great care; for the vapour, which is apt to escape through the junctures of the vessels, is very inflammable. This rectified oil, which in many pharmacopœias is styled *Ethereal*, is said not to have its specific gravity, smell, taste, or medical qualities, much improved by this process.

Med. use.—The Spirit of Turpentine, as this essential oil has been styled, is frequently taken internally as a diuretic and sudorific; and it has sometimes a considerable effect when taken to the extent of a few drops only. It has, however, been given in much larger doses, especially when mixed with honey. Recourse has principally been had to such doses in cases of chronic rheumatism, particularly in those modifications of it which are termed sciatica and lumbago; but sometimes they induce bloody urine.

Oil of turpentine, melted with as much ointment of yellow

resin as is sufficient to give it the consistence of a liniment, constitutes the application to recent burns so strongly recommended by Mr. Kenneth. He first bathes the part with heated oil of turpentine, alcohol, or tincture of camphor, and then covers it up with rags dipped in the liniment, which are to be renewed one at a time, once a day. As the inflammation subsides, less stimulating applications are to be used; and when the secretion of pus commences, the parts are then to be covered with powdered chalk heated to the temperature of the body. In this way, he assures us that he cured very many extensive burns in a few weeks, which, under the use of cooling applications, would have required as many months, or would have been altogether incurable.

The water employed in the distillation of volatile oils always absorbs some portion of the oil; as is evident from the smell, taste, and colour, which it acquires. It cannot, however, retain above a certain quantity; and therefore, such as has been already used and therefore almost saturated may be advantageously employed, instead of common water, in a second, third, or any future, distillation of the same subject.

After the distillation of one oil, particular care should be had to clean the worm perfectly before it be employed in the distillation of a different substance. Some oils, those of wormwood and aniseeds for instance, adhere to it so tenaciously, as not to be eluted out by heat, or washed off by water: the best way of removing these, is to run a little of spirit of wine through it.

Volatile oils, after they are distilled, should be suffered to stand for some days, in vessels loosely covered with paper, till they have lost their disagreeable fiery odour, and become limpid: then put them up in small bottles, which are to be kept quite full, closely stoppered, in a cool place. With these cautions, they will retain their virtues in perfection for many years.

Most of the oils mentioned above, are prepared by our chemists in Britain, and are easily procurable in a tolerable degree of perfection: but the oils from the more expensive spices, though all introduced among the preparations in the foreign pharmacopœias, are, when employed among us, usually imported from abroad.

These are frequently so much adulterated, that it is not easy to meet with such as are at all fit for use. Nor are these adulterations easily discoverable. The grosser abuses, indeed, may be easily detected. Thus, if the oil be mixed with alcohol, it will turn milky on the addition of water; if with expressed oils, alcohol will dissolve the volatile, and leave the other behind: if with oil of turpentine, on dipping a piece of paper in the mixture, and

drying it with a gentle heat, the turpentine will be betrayed by its smell. But the more subtle artists have contrived other methods of sophistication, which elude all trials of this kind.

Some have looked upon the specific gravity of oils as a certain criterion of their genuineness. This, however, is not to be absolutely depended on; for the genuine oils, obtained from the same subjects, often differ in gravity as much as those drawn from different ones. Cinnamon and cloves, whose oils usually sink in water, yield, if slowly and carefully distilled, oils of great fragrance, which are specifically lighter than the aqueous fluid employed in their distillation; whilst, on the other hand, the last runnings of some of the lighter oils, prove sometimes so ponderous as to sink in water.

As all volatile oils agree in the general properties of solubility in spirit of wine, indissolubility in water, miscibility with water, by the intervention of certain intermedia, volatility in the heat of boiling water, &c. it is plain that they may be variously mixed with each other, or the dearer sophisticated with the cheaper, without any possibility of discovering the abuse by any trials of this kind. And, indeed, it would not be of much advantage to the purchaser, if he had infallible criteria of the genuineness of every individual oil. It is of as much importance that they be *good*, as that they be *genuine*; for genuine oils, from inattentive distillation, and long and careless keeping, are often weaker both in smell and taste than the common sophisticated ones.

The smell and taste seem to be the only certain tests of which the nature of the thing will admit. If a bark should have in every respect the appearance of good cinnamon, and should be proved indisputably to be the genuine bark of the cinnamon tree; yet if it want the cinnamon flavour, or has it but in a low degree, we reject it; and the case is the same with the oil. It is only from use and habit, or comparisons with specimens of known quality, that we can judge of the goodness, either of the drugs themselves, or of their oils.

Most of the volatile oils indeed, are too hot and pungent to be tasted with safety; and the smell of the subject is so much concentrated in them, that a small variation in this respect is not easily distinguished: but we can readily dilute them to any assignable degree. A drop of the oil may be dissolved in spirit of wine, or received on a bit of sugar, and dissolved by that intermedium in water. The quantity of liquor which it thus impregnates with its flavour, or the degree of flavour which it communicates to a certain determinate quantity, will be the measure of the degree of goodness of the oil.

Medical use.—Volatile oils, medicinally considered, agree in the general qualities of pungency and heat; in particular virtues, they differ as much as the subjects from which they are obtained, the oil being the direct principle in which the virtues, or at least a considerable part of the virtues of the several subjects reside. Thus, the carminative virtue of the warm seeds, the diuretic of juniper berries, the emmenagogue of favin, the nervine of rosemary, the stomachic of mint, the antiscorbutic of scurvygrafs, the cordial of aromatics, &c. are supposed to be concentrated in their oils.

There is another remarkable difference in volatile oils, the foundation of which is less obvious, that of the degree of their pungency and heat. These are by no means in proportion, as might be expected, to those of the subject they were drawn from. The oil of cinnamon, for instance, is excessively pungent and fiery; in its undiluted state it is almost caustic; whereas cloves, a spice which in substance is far more pungent than the other, yields an oil which is far less so. This difference seems to depend partly upon the quantity of oil afforded, cinnamon yielding much less than cloves, and consequently having its active matter concentrated into a smaller volume; partly upon a difference in the nature of the active parts themselves: for though volatile oils contain always the specific odour, and flavour of their subjects, whether grateful or ungrateful, they do not always contain the whole pungency: this resides frequently in a more fixed matter, and does not rise with the oil. After the distillation of cloves, pepper, and some other spices, a part of their pungency is found to remain behind: a simple tincture of them in alcohol is even more pungent than their pure essential oils.

The more grateful oils are frequently made use of for reconciling to the stomach medicines of themselves disgustful. It has been customary to employ them as correctors for the resinous purgatives; an use to which they do not seem to be well adapted. All the service they can here be of, is, to make the resin sit more easily at first on the stomach: far from abating the irritating quality upon which the violence of its operation depends, these pungent oils superadd a fresh stimulus.

Volatile oils are never given alone, on account of their extreme heat and pungency; which in some is so great, that a single drop let fall upon the tongue, produces a gangrenous eschar. They are readily imbibed by pure dry sugar, and in this form may be conveniently exhibited. Ground with eight or ten times their weight of sugar, they become soluble in aqueous liquors, and thus may be diluted to any assigned degree. Mucilages also render them miscible with water into an uniform milky liquor. They dissolve likewise in alcohol; the more fragrant in an equal weight, and

almost all of them in less than four times their own quantity. These solutions may be either taken on sugar, or mixed with syrups, or the like. On mixing them with water, the liquor grows milky, and the oil separates.

The more pungent oils are employed externally against paralytic complaints, numbness, pains. and aches, cold tumours, and in other cases where particular parts require to be heated or stimulated. The toothach is sometimes relieved by a drop of these almost caustic oils, received on cotton, and cautiously introduced into the hollow tooth.

CHAP. XXI.

EMPYREUMATIC VOLATILE OILS.

EMPYREUMATIC OILS agree in many particulars with the volatile oils already treated of, but they also differ from them in several important circumstances. The latter exist ready formed in the aromatic substances from which they are obtained, and are only separated from the fixed principles by the action of a heat not exceeding that of boiling water. The former, on the contrary, are always formed by the action of a degree of heat considerably higher than that of boiling water, and are the product of decomposition, and a new arrangement of the elementary principles of substances, containing at least oxygen, hydrogen, and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they do not differ very remarkably from the volatile oils, and are principally distinguished from them by their unpleasant pungent empyreumatic smell and rough bitterish taste. They are also more apt to spoil by the contact of the air, and the oftner they are re-distilled they become more limpid, less coloured, and more soluble in alcohol; whereas the essential oils, by repeated distillations, become thicker and less soluble in alcohol.

Their action on the body is exceedingly stimulant and heating.

OLEUM PETROLEI. *Lond.*

Oil of Petroleum.

Distil petroleum in a sand bath.

The oil obtained from this bitumen will be more or less thin according to the continuance of the distillation; and by its continuance the tar will at last be reduced to a black coal; and then the oil will be pretty deep in colour, but perfectly fluid, though very acrid and stimulating.

It is less disagreeable than some of the other empyreumatic oils which had formerly a place in our pharmacopœias, such as the oleum lateritium.

OLEUM SUCCINI PURISSIMUM. *Edin.*

Purified Oil of Amber.

Distil oil of amber in a glass retort with six times its quantity of water till two thirds of the water have passed into the receiver; then separate this very pure volatile oil from the water, and preserve it in close shut vessels.

OLEUM SUCCINI RECTIFICATUM. *Lond.*

Rectified Oil of Amber.

Take of

Oil of amber, one pound.

Distil three times.

Dub.

Take of

The oil which rises in the preparation of salt of amber, three pounds.

Distil a pound and a half.

The rectified oil has a strong bitumenous smell, and a pungent acrid taste. Given in a dose of ten or twelve drops, it heats, stimulates and promotes the fluid secretions; it is chiefly celebrated in hysterical disorders, and in deficiencies of the uterine purgations. Sometimes it is used externally, in liniments for weak or paralytic limbs, and rheumatic pains.

Off. prep.—Spt. am. succin. *Lond.*

MOSCHUS ARTIFICIALIS.

Artificial Musk.

By treating one part of oil of amber with four of nitrous acid, added in small portions at a time, and stirring them together with a glass rod, the oil is at last converted into a yellow resin, having the smell of musk, and known in Germany by the name of Arti-

ficial musk, where it is often used as a substitute for that expensive drug.

OLEUM ANIMALE. *Lond.*

Animal Oil.

Take of

Oil of hartshorn, one pound.

Distil three times.

OLEUM CORNU CERVINI RECTIFICATUM. *Dub.*

Rectified Oil of Hartshorn.

Take of

The oil which ascends in the distillation of the volatile liquor of hartshorn, three pounds.

Water, six pounds.

Distil a pound and a half.

ANIMAL OIL, thus rectified, is thin and limpid, of a subtle, penetrating, not disagreeable, smell and taste.

Medical use.—It is strongly recommended as an anodyne and antispasmodic in doses of from 15 to 30 drops. Hoffman reports, that it procures a calm and sweet sleep, which continues often for 20 hours, without being followed by any languor or debility, but rather leaving the patient more alert and cheerful than before: that it procures likewise a gentle sweat, without increasing the heat of the blood: that given to 20 drops or more, on an empty stomach six hours before the accession of an intermittent fever, it frequently removes the disorder; and that it is likewise a very general remedy in inveterate and chronical epilepsies, and in convulsive motions, especially if given before the usual time of the attack, and preceded by proper evacuations. How far empyreumatic oils possess the virtues that have been ascribed to them, has not yet been sufficiently determined by experience; the tediousness and trouble of the rectification having prevented their coming into general use, or being often prepared. They are liable also to more material inconvenience in regard to their medicinal use, namely, precariousness in their quality; for how perfectly soever they may be rectified, they gradually lose, in keeping, the qualities they had received from that process, and return more and more towards their original fetid state.

CHAP. XXII.

DISTILLED SPIRITS.

THE flavour and virtues of distilled waters are owing, as observed in the preceeding chapter, to their being impregnated with a portion of the volatile oil of the subject from which they are drawn. Alcohol, considered as a vehicle for these oils, has this advantage above water, that it keeps all the oil that rises with it perfectly dissolved into an uniform limpid liquor.

Nevertheless, many substances, which, on being distilled with water, impart to it their virtues in great perfection; if treated in the same manner with alcohol, scarcely give over to it any smell or taste. The cause of this difference is, that alcohol is not susceptible of so great a degree of heat as water. It is obvious, therefore, that some substances may be volatile enough to rise with the heat of boiling water, but not with that of boiling alcohol.

Thus, if cinnamon, for instance, be committed to distillation with a mixture of alcohol and water, or with proof-spirit, which is no other than a mixture of about equal parts of the two; the alcohol will arise first clear, colourless, and transparent, and almost without any taste of the spice; but as soon as the more ponderous watery fluid begins to arise, the oil comes freely over with it, so as to render the liquor highly odorous, sapid, and of a milky hue.

The proof spirit usually met with in the shops is very rarely pure, or free from all unpleasant flavour; which, though concealed by means of certain additions, plainly discovers itself when employed for the preparation of distilled spirits. This nauseous flavour does not begin to arise till after the alcohol has come over; which is the very time that the virtues of the ingredients begin also to arise most plentifully; and hence the liquor receives an ungrateful taint. To this cause principally is owing the general complaint, that the cordials of the apothecary are less agreeable than those of the same kind prepared by the distiller; the latter being extremely curious in rectifying or purifying the spirits, which he uses for what he calls fine goods, from all unpleasant flavour.

SPIRITUS CARI CARVI. *Edin.**Spirit of Caraway.*

Take of

Caraway seeds, bruised, half a pound ;

Diluted alcohol, nine pounds.

Macerate for two days in a close vessel ; then pour on as much water as will prevent empyreuma, and draw off by distillation nine pounds.

SPIRITUS CARVI. *Lond. Dub.**Spirit of Caraway.*

Take of

Caraway seeds, bruised, half a pound ;

Proof spirit of wine, one gallon ; (nine pounds, *Dub.*)

Water, sufficient to prevent empyreuma.

Draw off one gallon, (nine pounds, *Dub.*)

IN the same manner is prepared the same quantity of spirit from

SPIRITUS.

Cinnamon, bruised, one pound ;

Peppermint, in flower, one
pound and a half.

Spearmint, one pound and a half,

Pennyroyal, dried, a pound and
a half.Nutmeg, well bruised, two oun-
ces,*Off. prep.*—Succus coch. comp. *Ed.*

Pimento, bruised, half a pound,

{ LAURI CINNAMONI. *Edin.*{ Cinnamoni. *Lond. Dub.*{ Mentha Piperita. *Edin.*{ ——— Piperitidis. *Lond.*{ Mentha sativa. *Lond.*{ Pulegii. *Lond.*{ Myristica moschata. *Edin.*{ Nucis moschata. *Dub. Lond.*

{

{ Myrti Pimenta. *Edin.*{ Pimento. *Dub. Lond.*SPIRITUS LAVANDULÆ SPICÆ. *Ed.**Spirit of Lavender.*

Take of

Flowering spikes of lavender, fresh gathered, two pounds ;

Alcohol, eight pounds.

Draw off by the heat of boiling water, seven pounds.

SPIRITUS LAVENDULÆ. *Lond. Dub.**Spirit of Lavender.*

Take of

Fresh flowers of lavender, one pound and a half ;

Proof spirit of wine, one gallon, (nine pounds, *Dub.*)

Draw off by distillation in a water bath, five pints, (five pounds, *Dub.*)

Off. prep.—Spt. lav. comp. *Ed. Lond. Dub.* Linim. camph. comp. *Lond. Dub.*

By these directions, and in the same quantities, is prepared,

SPIRITUS RORISMARINI OFFICINALIS. *Ed.* SPIRITUS
RORISMARINI. *Lond.*
Spirit of Rosemary,

from two pounds of the flowering tops of rosemary, according to the Edinburgh college, and from a pound and a half according to the London.

Off. prep.—Linim sapon, comp. *Lond.*

WE think it unnecessary to make particular observations on each of these simple spirits, as their virtues are the same with those of the substances from which they are extracted, united to the stimulus of the alcohol. The alcohol in the spirits of lavender and rosemary, is almost pure; in the others it is diluted with about an equal weight of water.

SPIRITUS ANISI COMPOSITUS. *Lond.*
Compound Spirit of Aniseed.

Take of

Aniseed,

Angelica seed, of each, bruised, half a pound;

Proof spirit, one gallon;

Water, sufficient to prevent empyreuma.

Draw off one gallon by distillation.

THIS compound spirit, like the simple ones, is an agreeable cordial; indeed too agreeable, for by some they are so often resorted to, on the slightest sensation of flatulence in the stomach, that their use is attended with all the pernicious consequences of dram drinking.

SPIRITUS JUNIPERI COMMUNIS COMPOSITUS. *Ed.*
SPIRITUS JUNIPERI COMPOSITUS. *Lond. Dub.*
Compound Spirit of Juniper.

Take of

Juniper berries, well bruised, one pound;

Caraway seeds,

Sweet fennel seeds, each, bruised, one ounce and a half;

Diluted alcohol, nine pounds, (one gallon, *Lond.*)
 Macerate for two days, and having added as much water as will prevent empyreuma, draw off by distillation nine pounds. *Ed.* (one gallon, *Lond.*)

THE good and bad effects of this spirit exactly coincide with those of gin.

SPIRITUS RAPHANI COMPOSITUS. *Lond. Dub.*

Compound Spirit of Horse-Radish.

Take of

Fresh horse-radish root,
 Dried outer rind of Seville oranges, each two pounds ;
 Fresh herb of garden scurvy-grass, four pounds ;
 Bruised nutmegs, one ounce ;
 Proof spirit, two gallons, (eighteen pounds, *Dub.*)
 Water, sufficient to prevent empyreuma.
 Draw off two gallons, (eighteen pounds, *Dub.*)

THIS is an aromatic acrid spiritous liquor, but has no pretensions to the specific antiscorbutic properties formerly ascribed to it.

ALCOHOL AMMONIATUM FÆTIDUM, SIVE SPIRITUS AMMONIÆ FÆTIDUS. *Ed.* SPIRITUS ALCALI VOLATILIS FÆTIDUS. *Dub.*

Fetid Spirit of Volatile Alkali.

Take of

Spirit of ammonia, eight ounces, (ten ounces, *Dub.*)
 Assa foetida, half an ounce.
 Digest in a close vessel twelve hours ; then distil off, with the heat of boiling water, eight ounces.

SPIRITUS AMMONIÆ FÆTIDUS. *Lond.*

Fetid Spirit of Ammonia.

Take of

Proof spirit, six pints ;
 Sal ammoniac, one pound ;
 Assa foetida, four ounces.
 Potash, one pound and a half.
 Mix them, and draw off by distillation five pints, with a slow fire.

THIS spirit, the last formula of which is the best, as being most easily prepared, is designed as an anti-hysterical, and is undoubtedly a very elegant one. Volatile spirits, impregnated for these

purposes with different fetids, have been usually kept in the shops; the ingredient here chosen, is the best calculated of any for general use, and equivalent in virtue to them all. The spirit is pale when newly distilled, but acquires a considerable tinge by keeping.

CHAP. XXIII.

INFUSIONS.

WE have already explained the sense in which we employ the term Infusion. We confine it to the action of a menstruum, not assisted by ebullition, on any substance consisting of heterogeneous principles, some of which are soluble, and others insoluble, in that menstruum. The term is generally used in a more extensive, but we are inclined to think, a less correct, sense: thus, lime water and the mucilages, which are commonly classed with the infusions, are instances of simple solution, and the chalk mixture is the mechanical suspension of an insoluble substance. When the menstruum used is water, the solution is termed simply an Infusion; but when the menstruum is alcohol, it is called a Tincture; when wine or vinegar, a Medicated Wine or Vinegar. Infusions in water are extremely apt to spoil, and are generally extemporaneous preparations.

INFUSUM CINCHONÆ OFFICINALIS. *Ed.*

Infusion of Cinchona Bark.

Take of

Peruvian bark in powder, one ounce;

Water, one pound.

Macerate for twenty-four hours, and filter.

INFUSUM CORTICIS PERUVIANI. *Dub.*

Infusion of Peruvian Bark.

Take of

Peruvian bark, in coarse powder, one ounce;

Mucilage of gum-arabic, two ounces;

Water, twelve ounces.

Triturate the bark with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

THIS is a very elegant form of exhibiting the active principles of cinchona bark, and that in which it will sit lightest on weak and delicate stomachs. The trituration directed by the Dublin college will promote the solution, and the addition of the mucilage, will suspend the finest particles of the substance of the bark itself. The residuum of the cold infusion may be afterwards employed in making other preparations, especially the extract, for its virtues are by no means exhausted. But it must never be dried and fold, or exhibited in substance, for that would be a culpable fraud.

INFUSUM DIGITALIS PURPUREÆ. *Ed.*

Infusion of Foxglove.

Take of

Dried leaves of foxglove, one drachm ;

Boiling water, eight ounces ;

Spirit of cinnamon, one ounce.

Macerate for four hours, and filter.

THIS is the infusion so highly recommended by Withering. Half an ounce, or an ounce, of it, may be taken twice a-day in dropical complaints. The spirit of cinnamon is added to improve its flavour, and to counteract its sedative effects.

INFUSUM GENTIANÆ COMPOSITUM ; vulgo INFUSUM AMARUM. *Ed.*

Compound Infusion of Gentian, or Bitter Infusion.

Take of

Gentian root, cut into pieces, half an ounce ;

Dried peel of Seville oranges, bruised, one drachm ;

Coriander seeds, bruised, half a drachm ;

Diluted alcohol, four ounces ;

Water, one pound.

First pour on the alcohol, and three hours thereafter add the water ; then macerate without heat for twelve hours, and strain.

INFUSUM GENTIANÆ COMPOSITUM. *Lond.*

Compound Infusion of Gentian.

Take of

The root of gentian, cut into pieces, one drachm.

Dried orange-peel, a drachm and a half;
 Fresh outer rind of lemons, half an ounce;
 Boiling water, twelve ounces by measure.
 Macerate for an hour, and strain.

Dub.

Take of

Bruised gentian root, two drachms;
 Fresh outer rind of lemons, half an ounce;
 Dried peel of Seville oranges, a drachm and a half;
 Diluted alcohol, four ounces;
 Boiling water, twelve ounces.
 First pour on the spirit, and after three hours, the water. Last-
 ly, after macerating two hours, filter.

THESE formulæ are all essentially the same. The Edinburgh college employ the largest proportion of gentian; but they infuse it in cold water, which does not extract the bitter principle so quickly or so fully as boiling water, although it dissipates less of the flavour of the aromatics. The alcohol is a useful addition, both in promoting the extraction of the virtues of all the ingredients, and in preserving the infusion longer from spoiling.

Med. use.—Gentian is the strongest and purest of the European bitters, and readily imparts its virtues to water. These infusions are in very common use as stomachic and tonic.

INFUSUM MIMOSÆ CATECHU, vulgo INFUSUM JAPONICUM. *Ed.*

Infusion of Catechu, commonly called Japonic Infusion.

Take of

Extract of catechu in powder, two drachms and a half;
 Cinnamon, bruised, half a drachm;
 Boiling water, seven ounces;
 Simple syrup, one ounce.
 Macerate the extract and cinnamon in the water, in a covered vessel, for two hours, then strain it, and add the syrup.

As this preparation will not keep above a day or two, it must always be made extemporaneously. The two hours maceration, therefore, becomes very often extremely inconvenient; but it may be prepared in a few minutes by boiling, without in the least impairing the virtues of the medicine.

Med. use.—Extract of catechu is almost pure tannin. This infusion is therefore a powerfully astringent solution. The cinnamon and syrup render it sufficiently agreeable, and it will be

found serviceable in diarrhœas proceeding from a laxity of the intestines. Its dose is a spoonful or two every other hour, or after every loose stool.

INFUSUM RHEI PALMATI. *Ed.*

Infusion of Rhubarb.

Take of

Rhubarb, bruised, half an ounce ;

Boiling water, eight ounces ;

Spirit of cinnamon, one ounce.

Macerate the rhubarb in a close vessel with the water, for twelve hours ; then add the spirit, and strain the liquor.

THIS appears to be one of the best preparations of rhubarb, when designed as a purgative ; water extracting its virtue more effectually than either vinous or spirituous menstrua.

INFUSUM ROSÆ GALLICÆ. *Ed.*

Infusion of Roses.

Take of

The petals of red roses, dried, one ounce ;

Boiling water, five pounds ;

Sulphuric acid, one drachm ;

White sugar, two ounces.

Macerate the petals with the boiling water in an earthen vessel, which is not glazed with lead, for four hours ; then add the acid, strain the liquor, and dissolve the sugar in it.

INFUSUM ROSÆ. *Lond.*

Infusion of Roses.

Take of

Dried red roses, half an ounce ;

Diluted vitriolic acid, three drachms ;

Boiling distilled water, two pints and a half ;

Double refined sugar, an ounce and a half.

First pour the water on the petals in a glass vessel, then add the diluted vitriolic acid, and macerate for half an hour. Strain the liquor, when cold, and add the sugar.

INFUSUM ROSARUM ; olim, TINCTURA ROSARUM. *Dub.*

Infusion of Roses, formerly Tincture of Roses.

Take of

The petals of red rose buds, half an ounce ;

Diluted vitriolic acid, three drachms ;

Boiling water, three pounds ;

Double refined sugar, an ounce and a half.

First mix the acid with the water, in a glass or glazed earthen vessel. Macerate the petals in the mixture, then add the sugar to the liquor when cold and strained.

THE difference in the directions for preparing this infusion are immaterial. In fact, the rose leaves have very little effect, except in giving the mixture an elegant red colour. Its sub-acid and astringent virtues depend entirely on the sulphuric acid. Altogether, however, it is an elegant medicine, and forms a very grateful addition to juleps in hæmorrhagies, and in all cases which require mild coolers and sub-astringents: it is sometimes taken with boluses or electuaries of the bark, and likewise makes a good gargle.

INFUSUM SENNÆ SIMPLEX. *Lond.*

Simple Infusion of Senna.

Take of

Senna, an ounce and a half;

Ginger, powdered, one drachm;

Boiling distilled water, one pint.

Macerate them for an hour in a covered vessel, and strain the liquor when cold.

INFUSUM SENNÆ. *Dub.*

Infusion of Senna.

Take of

Senna, six drachms;

Ginger, powdered, half a drachm;

Boiling water, ten ounces.

Macerate them for an hour in a covered vessel, then filter.

THIS is a well contrived purgative infusion, the ginger correcting the drastic effects of the senna. But the quantity here ordered to be prepared at one time, is much too large, for an ounce as two is a sufficient dose. It is of advantage that it should be used fresh prepared, as it is apt to spoil very quickly.

INFUSUM SENNÆ TARTARISATUM. *Lond.*

Tartarised Infusion of Senna.

Take of

Senna, one ounce and a half;

Coriander seeds, bruised, half an ounce;

Crystals of tartar, two drachms;

Distilled water, one pint.

Dissolve the crystals of tartar by boiling in the water; then pour

the liquor, as yet boiling, on the fenna and seeds. Macerate for an hour in a covered vessel, and strain when cold.

THE addition of the super tartrate of potass renders the taste of the fenna less unpleasant, and also promotes its action.

INFUSUM TAMARINDI CUM SENNA. *Edin.*

Infusion of Tamarinds and Senna.

Take of

- Preserved tamarinds, one ounce ;
- Senna, one drachm ;
- Coriander seeds, bruised, half a drachm ;
- Brown sugar, half an ounce ;
- Boiling water, eight ounces.

Macerate for four hours, with occasional agitation, in a close earthen vessel, not glazed with lead, and strain the liquor.

It may also be made with double, triple, &c. the quantity of fenna.

THIS forms a mild and useful purge, excellently suited for delicate stomachs, and inflammatory diseases. The taste of the fenna is well covered by the aromatic sugar and by the acidity of the tamarinds.

CHAP. XXIV.

DECOCTIONS.

DECOCTIONS differ from infusions only in the action of the menstruum being assisted by a boiling heat. At the same time, however, that the increase of temperature facilitates and expedites the solution of some fixed principles, it gives others a tendency to decomposition, and dissipates all volatile matters. Decoction, therefore, can only be used with advantage for the extraction of principles which are neither volatilized nor altered by a boiling heat.

To promote the action of the menstruum, infusion is sometimes premised to decoction.

In compound decoctions, it is sometimes convenient not to put in all the ingredients from the first, but in succession, according to their hardness, and the difficulty with which their virtues are extracted ; and if any aromatic, or other substances containing

volatile principles, enter into the composition, the boiling decoction is to be simply poured upon them, and covered up until it cool.

Decoctions should be made in vessels sufficiently large to prevent any risk of boiling over, and should be continued without interruption, and gently.

DECOCTUM ALTHÆÆ OFFICINALIS. *Ed.*

Decoction of Marshmallows.

Take of

Dried marshmallow roots, bruised, four ounces ;

Raisins of the sun, stoned, two ounces ;

Water, seven pounds.

Boil down to five pounds ; strain the decoction, and after the feces have subsided, pour off the clear liquor.

MARSHMALLOW roots contain nothing soluble in water except mucilage, which is very abundant in them. This decoction is therefore to be considered merely as an emollient, rendered more pleasant by the acidulous sweetness of the raisins.

DECOCTUM ANTHEMIDIS NOBILIS ; vulgo, DECOCTUM CHAMÆMELI sive COMMUNE. *Ed.*

Common Decoction, or Decoction of Chamomile.

Take of

Chamomile flowers, dried, one ounce ;

Caraway seeds, bruised, half an ounce ;

Water, five pounds.

Boil for a quarter of an hour, and strain.

DECOCTUM CHAMÆMELI ; sive DECOCTUM PRO ENEMATE. *Dub.*

Decoction of Chamomile, or Decoction for Glysters.

Take of

Chamomile flowers, dried, half an ounce ;

Sweet fennel seeds, two drachms ;

Water, a pound.

Boil a little, and strain.

DECOCTUM PRO ENEMATE. *Lond.*

Decoction for Glysters.

Take of

The leaves of mallow, dried, one ounce ;

Chamomile flowers, dried, half an ounce ;

Water, one pint.

Boil, and strain,

DECOCTUM PRO FOMENTO. *Lond.**Decoction for Fomentations.*

Take of

The leaves of southernwood, dried,
 The tops of sea wormwood, dried,
 Chamomile flowers, dried, each one ounce;
 Bay leaves, dried, half an ounce;
 Distilled water, six pints.

Boil them a little, and strain.

THESE decoctions are merely solutions of bitter extractive, combined, in the second with mucilage, and in the others with essential oils. In making them, the aromatic substances should not be added until the decoction is nearly completed; for otherwise their flavour would be entirely dissipated.

It must, however, be acknowledged, that these impregnations are for the most part unnecessary for the purpose of glysters; and in general, the bulk and warmth of these produce a discharge before these medicines can have any effect.

As fomentations, their virtues also depend in a great measure on the warm water, of which they principally consist: and when the herbs themselves are applied, they act only as retaining heat and moisture for a longer time; and are a less convenient, and not more useful fomentation, than cloths wrung out of hot water.

DECOCTUM CINCHONÆ OFFICINALIS; vulgo DECOCTUM CORTICIS PERUVIANI. *Edin.**Decoction of Cinchona Bark,*

Take of

Cinchona bark, in powder, one ounce;
 Water, a pound and a half.

Boil for ten minutes in a covered vessel, and strain the liquor while hot.

DECOCTUM CORTICIS PERUVIANI. *Lond.**Decoction of Peruvian Bark.*

Take of

Peruvian bark, powdered, one ounce;
 Distilled water, one pint and three ounces.

Boil for ten minutes in a covered vessel, and strain the liquor while hot.

Dub.

Take of

Peruvian bark, in coarse powder, six drachms;
 Water, eighteen ounces.

Boil for ten minutes in a vessel almost covered, and strain the liquor, while hot, through linen.

CINCHONA bark readily yields its active principles to the action of boiling water, and in greater quantity than cold water is capable of retaining dissolved; therefore, when a saturated decoction cools, it becomes turbid, and there is always a deposition of a yellowish or reddish powder, while the supernatant liquor is reduced to the strength of a saturated cold infusion. Decoction therefore presents us with an easy means of obtaining immediately an active preparation of cinchona bark, and with one of greater strength, than a cold or even a warm infusion, provided it be drunk while tepid, and before it forms any deposition, or if the precipitate be diffused by agitation, after it is formed. As the precipitate contains no woody fibre, or other inert matter, it is extremely probable that in very small doses it would prove, if dried, a very powerful preparation of cinchona bark.

Formerly it was supposed that the strength of a decoction of cinchona bark, and similar substances, was increased by continuing the boiling for a great length of time; but this is now known to be a mistake; and indeed, after a certain time, the decoction becomes weaker instead of stronger, because water at different temperatures is capable of dissolving only a determinate proportion of its active principles; and therefore, as soon as it is saturated, any farther decoction is unnecessary. But moreover, these principles, when dissolved in water, are liable to be decomposed, and become inert, by the absorption of atmospheric oxygen, and this decomposition is increased by increase of temperature; and as boiling constantly presents new surfaces to the action of the air, it is evidently hurtful when protracted longer than what is just necessary to saturate the water. Ten minutes is supposed by the colleges to be sufficient for that purpose.

DECOCTUM DAPHNES MEZEREI. *Ed.*

Decoction of Mezereon.

Take of

The bark of mezereon root, two drachms;

Liquorice root, bruised, half an ounce;

Water, three pounds.

Boil with a gentle heat, down to two pounds, and strain the decoction.

FROM four to eight ounces of this decoction may be given four

times a-day, in some obstinate venereal and rheumatic affections. It operates chiefly by perspiration.

DECOCTUM GEOFFRÆÆ INERMIS. *Ed.*

Decoction of Cabbage-tree Bark.

Take of

Bark of the cabbage-tree, powdered, one ounce;

Water, two pounds.

Boil with a gentle fire down to one pound, and strain the decoction.

THIS is a powerful anthelmintic. It may be given in doses of one table spoonful to children, and four to adults. If disagreeable symptoms should arise from an over-dose, or from drinking cold water during its action, we must immediately purge with castor oil, and dilute with acidulated fluids.

DECOCTUM GUAIACI COMPOSITUM; vulgo DECOCTUM LIGNORUM. *Ed.*

Compound Decoction of Guaiacum, commonly called Decoction of the Woods.

Take of

Guaiacum raspings, three ounces;

Raisins, stoned, two ounces;

Sassafras root, sliced,

Liquorice root, bruised, each one ounce;

Water, ten pounds.

Boil the guaiacum and rasins with the water, over a gentle fire, to the consumption of one half, adding towards the end, the sassafras and liquorice, and strain the decoction without expression.

THIS decoction is of use in some rheumatic and cutaneous affections. It may be taken by itself, to the quantity of a quarter of a pint twice or thrice a-day, or used as an assistant in a course of mercurial or antimonial alteratives, the patient, in either case, keeping warm, in order to promote the operation of the medicine.

DECOCTUM HELLEBORI ALBI. *Lond.*

Decoction of White Hellebore.

Take of

The root of white hellebore, powdered, one ounce;

Distilled water, two pints ;
Rectified spirit of wine, two ounces.

Boil the water with the root to one pint, and, the liquor being cold and strained, add to it the spirit.

THIS decoction is only used externally as a wash, in tinea capitis, lepra, psora, &c. When the skin is very tender and irritable, it should be diluted with an equal quantity of water.

DECOCTUM HORDEI DISTICHI. *Ed.* DECOCTUM HORDEI. *Lond.*

Decoction of Barley. Barley Water.

Take of

Pearl barley, two ounces ;
Water, five pounds.

First wash off the mealy matter which adheres to the barley with some cold water ; then extract the colouring matter by boiling it a little with about half a pound of water. Throw this decoction away ; and put the barley thus purified into five pounds of boiling water, which is to be boiled down to one half, and strain the decoction.

DECOCTUM HORDEI COMPOSITUM. *Lond.*

Compound Decoction of Barley.

Take of

The decoction of barley, two pints ;
Figs, sliced, two ounces ;
Liquorice root, sliced and bruised, half an ounce ;
Raisins, stoned, two ounces ;
Distilled water, one pint.

Boil to two pints, and strain.

THESE liquors are to be used freely, as diluting drinks, in fevers and other acute disorders : hence it is of consequence that they should be prepared so as to be as elegant and agreeable as possible : for this reason they are inserted in the pharmacopœia, and the several circumstances which contribute to their elegance set down, for if any one of them be omitted, the beverage will be less grateful. As however they are much oftener prepared by nurses and servants than by the apothecary, these receipts might with great advantage be substituted for the ridiculous, and often dangerous specifics, with which domestic cookery books abound. We would therefore recommend this subject to the notice of the ingenious and scientific author of *Culina Famulatrix Medicina*, than whom, no one is more qualified, with the assistance of Archæus,

to reform Domestic Pharmacy. However trivial medicines of this class may appear to be, they are of greater importance in the cure of acute diseases than many more elaborate preparations.

DECOCTUM POLYGALÆ SENEGÆ. *Ed.*

Decoction of Seneka.

Take of

Seneka root, one ounce ;

Water, two pounds.

Boil down to sixteen ounces, and strain the decoction.

THE virtues of this decoction will be easily understood from those of the root from which it is prepared. The dose in hydroptic cases, and rheumatic or arthritic complaints, is two ounces, three or four times a-day, according to its effect.

DECOCTUM SIMILACIS SARSAPARILLÆ. *Ed. DE.*

COCTUM SARSAPARILLÆ. Lond. Dub.

Decoction of Sarsaparilla.

Take of

The root of sarsaparilla, sliced, six ounces ;

Distilled water, eight pints.

Digest for two hours, with a heat of about 195° ; then take out the root, and bruise it ; repeat the maceration for the same length of time, and in the same liquor, with the bruised root. Then boil the liquor down to four pints, press it out, and strain the decoction.

THE above formula is that of the London college ; and as that of the Edinburgh college differs from it only in omitting the second maceration, and that of the Dublin in not expressing the temperature in which it is to be performed, it was thought unnecessary to introduce them. It is indeed a very doubtful remedy, and its diaphoretic effects are probably owing to its being drunk warm. It is totally incapable of curing syphilis ; but by some it is thought useful in the sequelæ of that disease.

DECOCTUM SARSAPARILLÆ COMPOSITUM. *Lond.*

Dub.

Compound Decoction of Sarsaparilla.

Take of

The root of sarsaparilla, sliced and bruised, six ounces ;

Bark of the root of saffrafras,

Shavings of guaiacum wood,

Liquorice root, bruised, of each one ounce ;

Mezereon, three drachms ;

Distilled water, ten pints.

Macerate, with a gentle heat, for six hours ; then boil it down to five pints, adding, towards the end of the boiling, the mezereon, and strain the liquor.

THE directions of the Dublin college only differ in adding the liquorice root along with the mezereon, and in reducing the quantity of the ingredients used to one fourth part.

This compound decoction is said to be an improved mode of preparing the once highly celebrated Lisbon diet drink, which, after its first introduction into Britain, was so long kept a secret.

It operates as a diaphoretic, and may be given with advantage in rheumatic cases, and in some of the sequelæ of syphilis. Three or four ounces may be taken four times a-day.

DECOCTUM ULMI. *Lond.*

Decoction of Elm.

Take of

The fresh inner bark of elm, bruised, four ounces ;

Distilled water, four pints ;

Boil to two pints, and strain.

Under this form the elm bark has been highly celebrated for the cure of certain cutaneous eruptions ; but undeservedly, according to the experience of the most judicious practitioners.

CHAP. XXV.

MUCILAGES.

MUCILAGO AMYLI. *Ed. Lond.*

Mucilage of Starch.

Take of

Starch, half an ounce ;

Water, one pound.

Triturate the starch, gradually adding the water ; then boil them a little.

THE London college use only three drachms of starch to one pound of water. The mucilage thus formed is very useful in those cases where a glutinous substance is required; it is often successfully employed as a glyster, in diarrhœas depending on acrimony in the intestines.

MUCILAGO ASTRAGALI TRAGACANTHÆ. *Ed.*
Mucilage of Gum Tragacanth.

Take of

Gum tragacanth, in powder, one ounce;

Boiling water, eight ounces.

Macerate for twenty-four hours; then triturate carefully, that the gum may be dissolved; and press the mucilage through linen cloth.

MUCILAGO TRAGACANTHÆ. *Lond.*
Mucilage of Tragacanth.

Take of

Tragacanth, half an ounce:

Distilled water, ten ounces, by measure.

Macerate them, with a gentle heat, till the tragacanth be dissolved.

MUCILAGO GUMMI TRAGACANTHÆ. *Dub.*
Mucilage of Tragacanth.

Take of

Gum tragacanth, in powder, one drachm;

Boiling water, eight ounces.

Dissolve the gum by digestion; then strain the mucilage through linen.

GUM TRAGACANTH is difficultly soluble in water. When macerated in it, it swells, but does not dissolve. To effect the solution it must be beaten into a paste with some of the water; and the rest of the water must be added gradually, and incorporated with the paste by beating them together. Gum tragacanth is a very tenacious substance, and requires a very large proportion of water to form a fluid mucilage. That of the Edinburgh college, which is made with eight parts of water to one of the gum, is a paste rather than a mucilage. The London mucilage is made with twenty parts of water, and the Dublin with sixty-four.

MUCILAGO MIMOSÆ NILOTICÆ. *Ed.*
Mucilage of Gum Arabic.

Take of

Gum Arabic, in powder, one part;

Boiling water, two parts.

Digest with frequent agitation, until the gum be dissolved ; then press the mucilage through linen.

MUCILAGO ARABICI GUMMI. *Lond.*

Mucilage of Gum Arabic.

Take of

Gum-arabic, in powder, four ounces ;

Boiling distilled water, eight ounces.

Triturate the gum with the water until it be dissolved.

Dub.

Take of

Gum-arabic, in powder, four ounces ;

Boiling water, nine ounces.

Triturate the gum with the water, then press the mucilage through linen.

It is very necessary to pass the mucilage through linen, in order to free it from pieces of wood and other impurities, which always adhere to the gum ; the linen may be placed in a funnel.

Mucilage of gum arabic is very useful in many operations in pharmacy ; it is also much used for properties peculiar to those substances of its own class, and of all the gums it seems to be the purest.

Off. prep.—*Inf. cort. Peruv. Dub. Emulsio Arabica. Edin. Potio carb. calcis. Ed.*

MUCILAGO SEMINUM CYDONII MALI. *Lond.*

Mucilage of Quince-Seed.

Take of

Quince-seeds, one drachm ;

Distilled water, eight ounces, by measure.

Boil with a slow fire for ten minutes ; then pass it through linen.

THIS mucilage, though sufficiently agreeable, is perfectly superfluous, especially as it is apt to spoil, from being mixed with the other principles of the seeds soluble in water. It is, besides, never so transparent as mucilage carefully prepared from gum arabic, is not cheaper, and is unfit for many purposes, being coagulated by acids.

CHAP. XXVI.

S Y R U P S.

SYRUPI. *Lond. Dub.**Syrups.*

IN making syrups, where we have not directed either the weight of the sugar, or the manner in which it should be dissolved, this is to be the rule :

Take of

Double refined sugar, twenty-nine ounces ;

Any kind of liquor, one pint, (one pint and a half, *Dub.*)

Dissolve the sugar in the liquor, in a water bath ; (mix and boil down to one pound, *Dub.*) then set it aside for twenty-four hours ; take off the scum, and pour off the syrup from the feces, if there be any.

SYRUPS are solutions of sugar in any watery fluid, whether simple or medicated. Simple syrup is nutritious and demulcent. When made of fine sugar, it is transparent and colourless. If necessary, it is easily clarified, by beating to a froth the white of an egg with three or four ounces of water, mixing it with the syrup, and boiling the mixture for a few seconds, until the albumen coagulates, and enveloping all heterogenous matters, forms a scum, which may be easily taken off, or separated by filtration. When instead of simple water, any other fluid is used for dissolving the sugar, the syrup is then medicated. Medicated syrups are prepared, either with expressed juices, infusions, decoctions, or saline fluids. The object of forming these into syrups, is either to render them agreeable to the palate, or to preserve them from fermentation. In the latter case, the quantity of sugar added becomes a matter of great importance ; for, if too much be employed, the sugar will separate by crystallization ; and if too little, instead of preventing fermentation, it will accelerate it. About two parts of sugar to one of fluid are the proportions directed by the British colleges with this view. But, as in some instances, a larger quantity of fluid is added, and afterwards reduced to the proper quantity by decoction, it will not be superfluous to point out some circumstances, which shew the evapora-

tion to be carried far enough. These are the tendency to form a pellicle on its surface, when a drop of it is allowed to cool; the receding of the last portion of each drop, when poured out drop by drop, after it is cold; and, what is most to be relied on, its specific gravity when boiling hot, being about 1.3, or 1.385, when cold. The syrup which remains, after all the crystallizable sugar has been separated from it, has been much, and probably justly, recommended by some for the preparation of medicated syrups and electuaries, although its pharmaceutical superiority is actually owing to its impurity.

SYRUPUS SIMPLEX SIVE COMMUNIS. *Ed.*

Simple or Common Syrup.

Take of

Double refined sugar, in powder, fifteen parts;

Water, eight parts.

Let the sugar be dissolved by a gentle heat, and boiled a little, so as to form a syrup.

THIS preparation is a plain liquid, sweet, without flavour or colour; and is more convenient in extemporaneous prescription than sugar undissolved.

SYRUPUS ACIDI ACETOSI. *Ed.*

Syrup of Acetous Acid.

Take of

Acetous acid, two pounds and a half;

Double refined sugar, three pounds and a half.

Boil them so as to form syrup.

THIS is to be considered as simple syrup merely acidulated, and is by no means unpleasant. It is often employed in mucilaginous mixtures, and the like: and, on account of its cheapness, it is often preferred to syrup of lemons.

SYRUPUS ALLII. *Dub.*

Syrup of Garlic.

Take of

Garlic, sliced, one pound;

Double refined sugar, four pounds;

Boiling water, two pounds.

Macerate the garlic in the water in a close vessel for twelve hours, and add the sugar to the strained liquor.

THIS is a very disagreeable syrup; but when we wish to extract the virtues of garlic by a watery menstruum, it is the best means we can employ.

SYRUPUS ALTHÆÆ OFFICINALIS. *Edin.*

Syrup of Marshmallow.

Take of

Fresh marshmallow roots, sliced, one pound;

Water, ten pounds;

Double refined sugar, four pounds.

Boil the water with the roots to the consumption of one half, and strain the liquor, with strong expression. Suffer the strained decoction to remain at rest till the feces have subsided; add the sugar to the depurated decoction, and boil so as to make a syrup.

SYRUPUS ALTHÆÆ. *Lond.*

Syrup of Marshmallow.

Take of

Fresh root of marshmallow, bruised, one pound;

Double refined sugar, four pounds;

Distilled water, one gallon.

Boil the water with the marshmallow root to one half, and press out the liquor when cold. Set it by twelve hours; and, after the feces have subsided, pour off the liquor. Add the sugar, and boil it to the weight of six pounds.

THIS is merely a mucilaginous syrup, and is chiefly used in nephritic cases, for sweetening emollient decoctions, and the like.

SYRUPUS AMOMI ZINGIBERIS. *Edin.*

Syrup of Ginger.

Take of

Beat ginger, three ounces;

Boiling water, four pounds;

Double refined sugar, seven pounds and a half.

Macerate the ginger in the water in a close vessel, for twenty-four hours; strain the infusion, and form a syrup by adding the sugar.

SYRUPUS ZINGIBERIS. *Lond.*

Syrup of Ginger.

Take of

Ginger, bruised, four ounces;

Boiling distilled water three pints.

Macerate for four hours, and strain; then add double refined sugar, and make into a syrup, according to the general prescription.

THESE are agreeable and moderately aromatic syrups, impregnated with the flavour and virtues of the ginger.

Off. prep.—Elect. catechu, *Dub.* Elect. opiat. *Ed.* Pil aloes, *Lond.* Pil scill. *Lond. Dub.*

SYRUPUS CITRI AURANTII. *Edin.*

Syrup of Orange-Peel.

Take of

The fresh outer rind of Seville oranges, six ounces;

Boiling water, three pounds;

Double refined sugar, four pounds.

Macerate the rind in the water for twelve hours; then add to the filtered liquor the sugar, in powder, and, with a gentle heat, form a syrup.

SYRUPUS CORTICIS AURANTII. *Lond. Dub.*

Syrup of Orange-Peel.

Take of

Fresh outer rind of Seville oranges, eight ounces;

Boiling distilled water, five pints.

Macerate for twelve hours, in a close vessel; and, in the strained liquor, dissolve double refined sugar to make a syrup.

In making this syrup, it is particularly necessary that the sugar be previously powdered, and dissolved in the infusion with as gentle a heat as possible, to prevent the exhalation of the volatile parts of the peel. With these cautions, the syrup proves a very elegant and agreeable one, possessing a great share of the fine flavour of the orange peel.

Off. prep.—Elect. aromat. *Ed. Dub.* Elect. catechu comp. *Dub.* Elect. scammon. *Dub.*

SYRUPUS CITRI MEDICI; olim SYRUPUS LIMONUM. *Ed.*

SYRUPUS LIMONIS SUCCI. *Lond. Dub.*

Syrup of Lemons.

Take of

Juice of lemons, filtered after the feces have subsided, three parts, (two pints, *Lond.* two pounds, *Dub.*)

Double refined sugar, five parts, (fifty ounces, *Lond.* four pounds, *Dub.*)

Dissolve the sugar in the juice, so as to make a syrup.

SYRUPUS MANNÆ. *Dub.**Syrup of Manna.*

Take of

Manna,

Double refined sugar, each one pound

Senna, half an ounce ;

Boiling water, a pound.

Macerate the senna in the water, in a covered vessel, for twelve hours ; then, with the strained liquor mix the manna and the sugar, so that they may be dissolved.

THIS syrup is a mild purgative, and well adapted to children and persons of a delicate constitution.

SYRUPUS PAPAVERIS SOMNIFERI. *Ed.**Syrup of White Poppies.*

Take of

White poppy-heads, dried, and freed from the seeds, two pounds ;

Boiling water, thirty pounds ;

Double refined sugar, four pounds.

Macerate the sliced heads in the water for twelve hours : boil the infusion till only one third part of the liquor remain ; then strain the decoction with strong expression. Boil the strained decoction to the consumption of one half, and strain again ; lastly, add the sugar, and boil a little, so as to form a syrup.

SYRUPUS PAPAVERIS ALBI. *Lond.**Syrup of White Poppy.*

Take of

The heads of white poppies, dried, three pounds and a half ;

Double refined sugar, six pounds ;

Distilled water, eight gallons.

Slice and bruise the heads, then boil them in the water, to three gallons, in a water bath, saturated with sea-salt, and press out the decoction. Reduce this, by boiling, to about four pints, and strain it while hot, through a sieve, then through a thin woollen cloth, and set it aside for twelve hours, that the feces may subside. Boil the liquor, poured off from the feces, to three pints, and dissolve the sugar in it, that it may be made a syrup.

THIS syrup, impregnated with the narcotic matter of the poppy-heads, is given to children in doses of two or three drachms ; and to adults, of half an ounce to an ounce and upwards, for easing

pain, procuring rest, and answering the other intentions of mild opiates. Particular care is requisite in its preparation, that it may be always made, as nearly as possible, of the same strength; and accordingly the colleges have been very minute in their description of the process.

Off. prep.—*Confectio opiata, Lond.*

SYRUPUS OPII. *Dub.*

Syrup of Opium.

Take of

Extract of opium, forty-eight grains;

Boiling water, three pounds.

Macerate until the opium be dissolved, then add double refined sugar so as to make a syrup according to the general formula.

THIS syrup is an elegant substitute for the former. It is made with infinitely less trouble, and is always of an uniform strength. It contains about two grains and a half of opium in the ounce.

SYRUPUS PAPAVERIS ERRATICI. *Lond.*

Syrup of Red Poppy.

Take of

The fresh flowers of the red poppy, four pounds;

Boiling distilled water, four pints and a half.

Put the flowers, by degrees, into the boiling water, in a water bath, constantly stirring them. After this, the vessel being taken out of the bath, macerate for twelve hours; then press out the liquor, and set it apart, that the feces may subside. Lastly, make it into a syrup with double refined sugar.

THE design of putting the flowers into boiling water in a water bath is, that they may be a little scalded, so as to shrink enough to be all immersed in the water; without this precaution they can scarce be all got in: but they are to be continued no longer over the fire than till this effect is produced, lest the liquor become too thick, and the syrup be rendered ropy.

As a medicine it is perfectly insignificant.

SYRUPUS RHAMNI CATHARTICI. *Edin.*

Syrup of Buckthorn.

Take of

The juice of ripe buckthorn berries, depurated, two parts;

Double refined sugar, one part.

Boil them so as to form a syrup.

SYRUPUS SPINÆ CERVINÆ. *Lond.**Syrup of Buckthorn.*

Take of

The fresh juice of ripe buckthorn berries, one gallon ;

Ginger, bruised, one ounce ;

Pimento, powdered, one ounce and a half ;

Double refined sugar, seven pounds.

Set aside the juice for three days, that the feces may subside ; and then strain it. Macerate the ginger and pimento in a pint of the strained juice for four hours, and strain. Boil away the rest of the juice to three pints ; then add that part of the juice in which the ginger and pimento have been macerated, and form a syrup of it with the sugar.

BOTH these preparations in doses of three or four spoonfuls, operate as brisk cathartics. The principal inconveniencies attending them are their being very unpleasant, and their occasioning a thirst and dryness of the mouth and fauces, and sometimes violent gripes ; these effects may be prevented by drinking liberally of water-gruel, or other warm liquids, during the operation.

SYRUPUS ROSÆ GALLICÆ. *Ed.**Syrup of Red Roses.*

Take of

The dried petals of red roses, seven ounces ;

Double refined sugar, six pounds ;

Boiling water, five pounds.

Macerate the roses in the water for twelve hours, then boil a little and strain the liquor, add to it the sugar, and boil again for a little so as to form a syrup.

THIS syrup is supposed to be mildly astringent ; but is principally valued on account of its red colour.

Off. prep.—*Elect. catechu.* *Ed.*

SYRUPUS ROSÆ CENTIFOLIÆ. *Ed.**Syrup of Damask Roses.*

Take of

The fresh petals of the damask rose, one pound ;

Boiling water, four pounds.

Double refined sugar, three pounds.

Macerate the roses in the water for twelve hours ; then to the infusion strained add the sugar, and boil them into a syrup.

SYRUPUS ROSÆ. *Lond.**Syrup of Roses.*

Take of

The dried petals of the damask rose, seven ounces ;

Double refined sugar, six pounds ;

Boiling distilled water, four pints.

Macerate the roses in the water for twelve hours, and strain.

Evaporate the strained liquor to two pints and a half, and add the sugar, that it may be made a syrup.

THIS syrup is an agreeable and mild purgative for children, in the dose of half a spoonful, or a spoonful. It likewise proves gently laxative to adults ; and with this intention may be of service in costive habits.

Off. prep.—Elect. cassiæ, *Ed. Lond. Dub.* Elect. scammon. *Lond.*

SYRUPUS SCILLÆ MARITIMÆ. *Ed.**Syrup of Squills.*

Take of

Vinegar of squills, two pounds ;

Double refined sugar in powder, three pounds and a half.

Dissolve the sugar with a gentle heat, so as to form a syrup.

THIS syrup is used chiefly in doses of a spoonful or two, for promoting expectoration, which it does very powerfully. It is also given as an emetic to children.

SYRUPUS TOLUIFERÆ BALSAMI ; vulgo SYRUPUS BALSAMICUS. *Ed.**Syrup of Balsam of Tolu, formerly Balsamic Syrup.*

Take of

Common syrup, two pounds ;

Tincture of balsam of Tolu, one ounce.

With the syrup recently prepared, and when it has almost grown cold after having been removed from the fire, gradually mix the tincture with constant agitation.

SYRUPUS TOLUTIANUS. *Lond.**Syrup of Tolu.*

Take of

The balsam of Tolu, eight ounces ;

Distilled water, three pints.

Boil for two hours. Mix the double refined sugar with the liquor, strained after it is cold, that it may be made a syrup.

THE intention of the contrivers of the two foregoing processes seems to have been somewhat different. In the latter, which is certainly the most elegant, the benzoic acid of the balsam alone is contained; the other syrup contains the whole substance of the balsam in larger quantity. They are both moderately impregnated with the agreeable flavour of the balsam.

SYRUPUS VIOLÆ ODORATÆ. *Edin.*

Syrup of Violets.

Take of

Fresh violets, one pound;

Boiling water, four pounds;

Double refined sugar, seven pounds and a half.

Macerate the violets in the water for twenty-four hours in a glass or glazed earthen vessel, close covered, then strain without expression, and to the strained infusion add the sugar, powdered, so as to form a syrup.

SYRUPUS VIOLÆ. *Lond. Dub.*

Syrup of Violets.

Take of

The fresh petals of the violet, two pounds;

Boiling distilled water, five pints, (six pounds, *Dub.*)

Macerate for twenty-four hours; afterwards strain the liquor, without expression, through thin linen. Add double refined sugar, that it may be made a syrup.

THIS syrup has a very agreeable flavour; and in the quantity of a spoonful or two proves to children gently laxative. It is apt to lose, in keeping, the elegant blue colour, for which it is chiefly valued; and hence some have been induced to counterfeit it with materials whose colour is more permanent, and which are more easily obtained. This abuse may be readily discovered, by adding to a little of the suspected syrup any acid or alkaline liquor. If the syrup be genuine, the acid will change it red, and the alkali green; but if counterfeit, these changes will not happen. From this mutability of the colour of the violet, it forms an excellent test of the presence of acids and alkalies; and, it is also obvious, that a prescriber would be deceived, if he should expect to give any blue tinge to acidulated or alkalized juleps or mixtures, by the addition of the blue syrup.

CHAP. XXVII.

MEDICATED HONEYS.

MEL DESPUMATUM. *Dub.* **MELLIS DESPUMATIO.** *Lond.*
Clarified Honey. The Clarification of Honey.

Melt the honey in a water bath, and remove the scum as it rises.

IN this simple process, the honey is rendered so liquid by the heat of the boiling water, that the wax and other lighter impurities which it commonly contains, rise to the surface in the form of a scum, which is easily removed. At the same time, sand or any heavier mixture of that kind sinks to the bottom.

Honey was supposed to be peculiarly balsamic, and was therefore at one time much used in pharmacy. But as its saccharine matter is absolutely of the same nature with that of sugar, and as the extraneous matters which it always contains, make it disagree with the stomachs of many individuals, the number of medicated honeys has been much diminished, and their place in some instances supplied by syrups. Medicated honeys are known to be of a proper consistence, by allowing a small quantity to cool on a plate, if when divided by the edge of a spoon, the portions do not immediately reunite, or if the specific gravity, when hot, be 1.26, or 1.31, when cold.

MEL ACETATUM. *Lond.* **OXYMEL SIMPLEX.** *Dub.*
Acetated Honey. Simple Oxymel.

Take of

Clarified honey, two pounds;

Distilled vinegar, one pound by weight.

Boil them in a glass vessel with a gentle fire to the consistency of a syrup, (*Lond.*)

Having mixed them, bring them thrice to boil in a glass vessel; and remove the scum each time, (*Dub.*)

THIS syrup is now hardly ever prepared by the apothecary,

but is a favourite and useful domestic remedy in colds and slight sore throats.

OXYMEL COLCHICI. *Lond.*

Oxymel of Meadow Saffron.

Take of

The fresh root of meadow saffron, cut into thin slices, one ounce;

Distilled vinegar, one pint;

Clarified honey, two pounds.

Macerate the root of meadow saffron with the vinegar, in a glass vessel, with a gentle heat, for forty-eight hours. Strain the liquor, pressed out strongly from the root, and add the honey. Lastly, boil the mixture, frequently stirring it with a wooden spoon, to the thickness of a syrup.

THIS is an active preparation, but its use may be entirely superseded by the syrup of the same root.

MEL ROSÆ. *Lond. Dub.*

Honey of Roses.

Take of

Dried red rose buds, (with the heels cut off, *Dub.*) four ounces;

Boiling distilled water, three pints;

Clarified honey, (honey, *Dub.*) five pounds.

Macerate the rose buds in the water for six hours; then mix the honey with the strained liquor, and boil the mixture to the thickness of a syrup, (removing the scum, *Dub.*)

THIS preparation is not unfrequently used as a mild cooling detergent, particularly in gargles for ulcerations and inflammation of the mouth and tonsils. The rose buds here used should be hastily dried, that they may the better preserve their astringency.

The Dublin college, in making this and other similar preparations, used unclarified honey, with the idea, probably, that it may be equally well clarified in the course of the preparation itself. This is no doubt true, but as we do not know what effect the clarification may have on the active substances added to the honey, we think that the use of clarified honey, as directed by the London college, is preferable.

MEL SCILLÆ. *Lond* MEL SCILLITICUM. *Dub.*
Honey of Squills.

Take of

Clarified honey, (honey, *Dub.*) three pounds;

Tincture of squills, two pints.

Boil them in a glass vessel to the thickness of a syrup, (removing the scum, *Dub.*)

THIS is merely a sweetened tincture of squills, and when wanted, may be prepared extemporaneously.

OXYMEL SCILLÆ. *Lond*
Oxymel of Squills.

Take of

Clarified honey, three pounds;

Vinegar of squills, two pints.

Boil them in a glass vessel, with a slow fire, to the thickness of a syrup.

OXYMEL of squills is a useful aperient, detergent, and expectorant, and of great service in humoral asthmas, coughs, and other disorders where thick phlegm abounds. It is given in doses of two or three drachms, along with some aromatic water, as that of cinnamon, to prevent the great nausea which it would otherwise be apt to excite. In large doses, it proves emetic.

OXYMEL ÆRUGINIS. *Lond.*
Oxymel of Verdegris.

Take of

Prepared verdegris, one ounce;

Vinegar, seven ounces:

Clarified honey, fourteen ounces.

Dissolve the verdegris in the vinegar, and strain it through linen; then add the honey, and boil the whole to a proper thickness.

WHEN properly diluted with water, this preparation has been recommended in venereal ulcerations of the mouth and tonsils; although from the risk of a portion of it being swallowed, other detergent gargles are to be preferred. Externally it is applied mixed with any digestive ointment, to destroy fungous flesh, and to excite unhealthy ulcers.

CHAP. XXVIII.

EMULSIONS and MIXTURES.

IN this chapter we comprehend those mixtures in which oils, and other substances insoluble in water, are mixed with, and suspended in watery fluids, by means of viscid substances, such as mucilage and syrups.

EMULSIO AMYGDALÆ COMMUNIS. *Edin.**Almond Emulsion.*

Take of

Sweet almonds, one ounce;

Water, two pounds and a half.

Beat diligently the blanched almonds in a stone mortar, gradually pouring on them the water; then strain the liquor.

LAC AMYGDALÆ. *Lond.* **LAC AMYGDALARUM.** *Dub.**Almond Milk.*

Take of

Sweet almonds, an ounce and a half;

Double refined sugar, half an ounce;

Distilled water, two pints.

Beat the almonds with the sugar; then rubbing them together, add by degrees the water, and strain the liquor.

EMULSIO MIMOSÆ NILOTICÆ; vulgo EMULSIO ARABICA. *Edin.**Arabic Emulsion.*

Is made in the same manner as the almond emulsion, only adding, while beating the almonds,

Mucilage of gum arabic, two ounces.

EMULSIO ARABICA. *Dub.**Arabic Emulsion.*

Take of

Gum arabic, in powder, two drachms;

Almonds, blanched, half an ounce;

Double refined sugar, three drachms;

Decoction of barley, one pound.

Dissolve the gum in the warm decoction, and when it is almost cold, pour it upon the almonds, previously well beaten with the sugar, and at the same time triturate them together, so as to form a kind of milk, and then filter.

ALL these may be considered as possessing nearly the same qualities. They are merely mechanical suspensions of oil of almonds in watery fluids, by means either of the mucilage with which it is naturally combined in the almonds by itself, or assisted by the addition of gum arabic and sugar. Therefore, on standing for some days, the oily matter separates and rises to the top, not in a pure form, but like thick cream. By heat the same decomposition is immediately effected.

Great care should be taken that the almonds have not become rancid by keeping, which not only renders the emulsion extremely unpleasant, a circumstance of great consequence in a medicine that requires to be taken in large quantities, but likewise gives it injurious qualities.

The almonds are blanched by infusing them in boiling water, and peeling them. The success of the preparation depends upon beating the almonds to a smooth pulp, and triturating them with each portion of the watery fluid, so as to form an uniform mixture before another portion be added.

These liquors are principally used for diluting and correcting acrimonious humours; particularly in heat of urine and stranguries, arising either from a natural acrimony of the juices, or from the operation of cantharides, and other irritating medicines; in these cases, they are to be drunk frequently, to the quantity of half a pint or more at a time.

EMULSIO CAMPHORATA. *Edin.*

Camphorated Emulsion.

Take of

Camphor, one scruple;
Sweet almonds, blanched, two drachms;
Double refined sugar, one drachm;
Water, six ounces.

THIS is made in the same manner as the common almond emulsion.

MISTURA CAMPHORATA. *Lond.*

Camphorated Mixture.

Take of

Camphor, one drachm;

Rectified spirit of wine, a little;
 Double refined sugar, half an ounce;
 Boiling distilled water, one pint.

Rub the camphor first with the spirit of wine, then with the sugar; lastly, add the water by degrees, and strain the mixture.

NEITHER of these mixtures are very permanent, as the camphor separates and swims upon the surface in the course of a few days. As extemporaneous prescriptions, they are, however, very convenient modes of exhibiting that active drug, and may be given to the extent of a table spoonful every three or four hours in typhoid fevers. In the preceding edition of the London Pharmacopœia, ten drops of spirit were ordered instead of the present indeterminate quantity.

LAC AMMONIACI. *Lond. Dub.*

Emulsion of Gum Ammoniac.

Take of

Gum ammoniac, two drachms;

Distilled water, half a pint, (eight ounces, *Dub.*)

Rub the gum resin with the water, gradually poured on, until it becomes an emulsion.

LAC ASSÆ FOETIDÆ. *Lond.*

Emulsion of Assa Fœtida

In the same manner may be made an emulsion of assa fœtida, and the rest of the gum resins.

THE lac ammoniaci is employed for attenuating tough phlegm, and promoting expectoration in humoral asthmas, coughs, and obstructions of the viscera. It may be given to the quantity of two spoonfuls twice a-day.

It answers the same purposes as assa fœtida in substance, and on some occasions is a more convenient, though very disagreeable, mode of exhibiting it.

MISTURA MOSCHATA. *Lond.*

Musk Mixture.

Take of

Musk, two scruples;

Gum arabic, powdered,

Double refined sugar, of each one drachm;

Rose water, six ounces, by measure.

Rub the musk first with the sugar, then with the gum, and add the rose water by degrees.

UNLESS the musk be very thoroughly triturated with the sugar and gum before the addition of the water it soon separates. An ounce, or an ounce and a half, may be taken for a dose.

POTIO CARBONATIS CALCIS; olim POTIO CRETACEA. *Ed.*
Chalk Potion.

Take of

Prepared carbonate of lime, one ounce;
Double refined sugar, half an ounce;
Mucilage of gum arabic, two ounces.

Triturate together, and then gradually add of

Water, two pounds and a half;
Spirit of cinnamon, two ounces.

Mix them.

MISTURA CRETACEA. *Lond. Dub.*
Chalk Mixture.

Take of

Prepared chalk, one ounce, (half an ounce, *Dub.*);
Double refined sugar, six drachms, (three drachms, *Dub.*);
Gum arabic, powdered, one ounce;
Distilled water, two pints, (fifteen ounces, *Dub.*)

Mix them.

THIS is a very elegant form of exhibiting chalk, and is an useful remedy in diseases arising from or accompanied with acidity in the primæ viæ. It is frequently employed in diarrhoea proceeding from that cause. The mucilage not only serves to keep the chalk uniformly diffused, but also improves its virtues. Of this medicine a pound or two may be taken in the course of a day.

DECOCTUM CORNU CERVI. *Lond.*
Decoction of Hartshorn.

Take of

Burnt and prepared hartshorn, two ounces;
Gum arabic, six drachms;
Distilled water, three pints.

Boil, constantly stirring, to two pints; and strain.

PREPARED hartshorn is phosphate of lime in a minute state of mechanical division. By boiling in a mucilaginous liquid, it will be diffused and imperfectly suspended, but not a particle of it will be dissolved. This is therefore an extremely injudicious preparation; for phosphate of lime would be much more easily and effectually suspended by triturating it with a larger proportion of gum arabic, and adding the water gradually. But we believe that this preparation has no other action than that of a weak mucilage.

CH A P. XXIX.

MEDICATED VINEGARS.

INFUSIONS of vegetable substances in acetic acid are commonly called Medicated Vinegars. The action of the acid in this case may be considered as twofold.

1. It acts simply as water, in consequence of the great quantity of water which enters into its composition, and generally extracts every thing which water is capable of extracting.

2. It exerts its own peculiar action as an acid. In consequence of this, it sometimes increases the solvent power of its watery portion, or dissolves substances which water alone is incapable of dissolving, and in a few instances it impedes the solution of substances which water alone would dissolve.

As acetic acid, in itself sufficiently perishable, has its tendency to decomposition commonly increased by the solution of any vegetable matter in it, it should never be used as a menstruum, unless where it promotes the solution of the solvent, as in extracting the acrid principle of squills, colchicum, &c. and in dissolving the volatile, and especially the empyreumatic oils, or where it coincides with the virtues of the solvent.

ACETUM AROMATICUM. Ed.

Aromatic Vinegar.

Take of

Rosemary tops, dried,
Sage leaves, dried, each four ounces;
Lavender flowers, dried, two ounces;
Cloves, two drachms;
Distilled acetous acid, eight pounds.

Macerate for seven days, express the liquor, and strain it through paper.

THIS is given as an improved preparation of the *Vinaigre des quatre voleurs*, which was supposed to be a certain prophylactic against the contagion of plague and similar diseases. It is in fact a pleasant solution of essential oils in vinegar, which will have more effect in correcting bad smells, than in preventing fever.

ACETUM COLCHICI. Dub.

Vinegar of Meadow Saffron.

Take of

The recent root of colchicum, cut in slices, one ounce;
Vinegar, one pound;
Diluted spirit of wine, one ounce and a half.

Macerate the root in the vinegar for four days, in a glass vessel, frequently agitating them; then express the acid, to which, decanted from the feces, after they have subsided, add the spirit.

THE acrid principle in which the virtue of the colchicum resides, is more soluble in vinegar than in water: this is therefore a preparation of considerable activity. The diluted alcohol is added merely to prevent it from spoiling.

ACETUM SCILLÆ MARITIMÆ. Ed.

Vinegar of Squills.

Take of

Dried squills, two ounces;
Distilled acetous acid, two pounds and a half;
Alcohol, three ounces.

Macerate the squills in the acetous acid for seven days; then press out the liquor, to which add the alcohol; and when the feces have subsided, pour off the clear liquor.

ACETUM SCILLÆ. *Lond.**Vinegar of Squills.*

Take of

Squills, recently dried, one pound;

Vinegar, six pints;

Proof spirit, half a pint.

Macerate the squills with the vinegar in a glass vessel, with a gentle heat for twenty-four hours; then express the liquor, and set it aside until the feces subside. To the decanted liquor add the spirit.

ACETUM SCILLITICUM. *Dub.**Squill Vinegar.*

Take of

Squills, recently dried, half a pound;

Vinegar, three pounds;

Proof spirit, four ounces.

Macerate the squills in the vinegar for four days in a glass vessel, frequently agitating it; then express the acid; to which, poured from the feces after they have subsided, add the spirit.

VINEGAR of squills is a medicine of great antiquity. It is a very powerful stimulant; and hence it is frequently used, with great success, as a diuretic and expectorant. The dose of this medicine is from a drachm to half an ounce: where crudities abound in the first passages, it may be given at first in a larger dose, to evacuate them by vomiting. It is most conveniently exhibited along with cinnamon, or other agreeable aromatic waters, which prevent the nausea it would otherwise, even in small doses, be apt to occasion.

Off. præp.—Syr. scillæ, *Ed.*ACIDUM ACETOSUM CAMPHORATUM. *Ed.**Camphorated Acetous Acid.*

Take of

The stronger acetous acid, six ounces;

Camphor, half an ounce.

Reduce the camphor to powder, by triturating it with a little alcohol; then dissolve it in the acid.

THE alcohol in this preparation is used merely to facilitate the reduction of the camphor to powder; for the strong acetous, or, as we would rather call it, the acetic acid, is capable of dissolving

even a larger proportion of camphor than is directed in the above formula.

This solution is a powerful analeptic remedy. Its vapour snuffed up the nostrils, which is the only method of using it, is one of the most pungent stimuli we possess. It is so extremely volatile, that it cannot be preserved without excluding it from the contact of the air; and it is so powerful a menstruum, that it corrodes cork, and almost all common metals except gold. It should therefore be kept in glass phials, with ground glass stoppers, or in small gold boxes, such as are used for Henry's aromatic spirit of vinegar, for which it is in fact a simpler substitute.

CHAP. XXX.

TINCTURES.

THE term Tincture has often been employed in a very vague sense. It is now commonly applied to solutions, made by digestion, in alcohol, or diluted alcohol. But it is also, though perhaps incorrectly, extended to solutions in ether, ethereal spirits, and spirit of ammonia.

Alcohol is capable of dissolving resins, gum resins, extractive tannin, sugar, volatile oils, soaps, camphor, adipocere, colouring matters, acids, alkalies, and some compound salts. Many of these, as the gum resins, soaps, extractive, tannin, sugar, and saline substances, are also soluble in water, while water is capable of dissolving substances, such as gum, gelatin, and most of the compound salts, which are insoluble in alcohol. But the insolubility of these substances in the different menstrua is not absolute, but merely relative; for a certain proportion of alcohol may be added to a solution of gum in water without decomposing it; and a solution of resin in alcohol will bear a certain admixture of water without becoming turbid. Therefore, diluted alcohol, which is a mixture of these two menstrua, sometimes extracts the virtues of heterogenous compounds more completely than either of them separately.

Alcohol is used as a menstruum.

TINCTURA ALOES COMPOSITA. *Lond.**Compound Tincture of Aloes.*

Take of

Socotorine aloes,

Saffron, of each three ounces ;

Tincture of myrrh, two pints ;

Digest for eight days, and strain.

THIS is supposed to be an improvement on the elixir proprietatis of Paracelsus. These tinctures differ considerably in strength ; the latter contains one part of aloes to eight of the menstruum ; the former one to sixteen, while the simple tincture already mentioned contains but one to thirty-two. In prescription these proportions must be attended to. The myrrh and saffron may add to its stimulating properties.

TINCTURA AMOMI REPENTIS. *Ed.**Tincture of Cardamom.*

Take of

Lesser cardamom seeds, bruised, four ounces ;

Diluted alcohol, two pounds and a half.

Digest for seven days, and filter through paper.

TINCTURA CARDAMOMI. *Lond. Dub.**Tincture of Cardamom.*

Take of

Lesser cardamom seeds, husked and bruised, three ounces ;

Proof spirit, two pints, (two pounds, *Dub.*)Digest for eight days, (seven, *Dub.*) and strain.

TINCTURE of cardamoms has been in use for a considerable time. It is a pleasant warm cordial ; and may be taken, along with any proper vehicle, in doses of from a drachm to a spoonful or two.

TINCTURA CARDAMOMI COMPOSITA. *Lond. Dub.**Compound Tincture of Cardamom.*

Take of

Lesser cardamom seeds, husked,

(Cochineal, *Lond.*)

Caraway seeds, each, powdered, two drachms ;

Cinnamon, bruised, half an ounce ;

Raisins, stoned, four ounces ;

Proof spirit, two pints, (two pounds, *Dub.*)

Digest for fourteen days, and strain.

THIS tincture is somewhat less stimulant than the compound tincture of cinnamon, which, besides a larger proportion of aromatics, contains also long pepper. Altogether, although it may be sufficiently pleasant, the composition is injudicious; for the large proportion of raisins used forms only a very uneconomical and inelegant method of sweetening an aromatic tincture.

TINCTURA ARISTOLOCHIÆ SERPENTARIÆ. *Ed.*

Tincture of Snake-root.

Take of

Virginian snake-root, bruised, two ounces;

Cochineal, in powder, one drachm;

Diluted alcohol, two pounds and a half.

Digest for seven days, and strain through paper.

TINCTURA SERPENTARIÆ. *Lond. Dub.*

Tincture of Snake-root.

Take of

Virginian snake-root, three ounces;

Proof spirit, two pints, (two pounds, *Dub.*)

Digest for eight days, (seven, *Dub.*) and strain.

THIS tincture, which contains the whole virtues of the root, may be taken to the quantity of a spoonful or more every five or six hours; and to this extent it often operates as an useful diaphoretic.

TINCTURA AURANTII CORTICIS. *Lond. Dub.*

Tincture of Orange-Peel.

Take of

Fresh orange-peel, three ounces;

Proof spirit, two pints, (two pounds, *Dub.*)

Digest for three days, and strain.

THIS tincture is an agreeable bitter, flavoured at the same time with the essential oil of the orange-peel.

TINCTURA BALSAMI PERUVIANI. *Lond.*

Tincture of Balsam of Peru.

Take of

Balsam of Peru, four ounces;

Rectified spirit of wine, one pint.

Digest until the balsam be dissolved.

THE Balsam of Peru is totally soluble in alcohol, and is therefore well fitted for being exhibited in the form of a tincture; but it is now very rarely employed.

TINCTURA BENZOIN COMPOSITA; vulgo **BALSAMUM TRAUMATICUM.** *Lond. Ed.*
Compound Tincture of Benzoin.

Take of

Benzoin, in powder, three ounces;

(Storax, strained, two ounces, *Lond.*)

Balsam of Tolu, one ounce;

Socotorine aloes, in powder, half an ounce;

• Alcohol, two pounds.

Digest with a gentle heat for three days, (*seven, Ed.*) and strain.

THE Edinburgh college omit the storax, and use hepatic aloes in place of the socotorine. These differences are not very material; and both preparations may be considered as elegant simplifications of some very complicated compositions, which were celebrated under different names; such as Baume de Commandeur, Wade's balsam, Friars balsam, Jesuits drops, &c. These, in general, consisted of a confused farrago of discordant substances.

TINCTURA CAMPHORÆ; vulgo **SPIRITUS VINOSUS CAMPHORATUS.** *Edin. Lond. Dub.*
Tincture of Camphor. Camphorated Spirit.

Take of

Camphor, one ounce. *Ed.* four ounces, *Lond.* half an ounce, *Dub.*

Alcohol, one pound, *Ed.* two pints, *Lond.* eight ounces, *Dub.*

Mix them together, that the camphor may be dissolved.

(It may also be made with a double, triple, &c. proportion of camphor, *Ed.*)

THESE solutions of camphor are only employed for external uses, against rheumatic pains, paralytic numbnesses, inflammations, for discussing tumours, preventing gangrenes, or restraining their progress. They are too pungent to be exhibited internally, and cannot be diluted with water, without being totally decomposed.

Off. prep.—Aqua zinci vit. cum camph. *Lond.*

TINCTURA CASCARILLÆ. *Lond. Dub.**Tincture of Cascarilla.*

Take of

The bark of cascarilla, powdered, four ounces ;

Proof spirit, two pints, (two pounds, *Dub.*)Digest with a gentle heat for eight days, (seven, *Dub.*) and strain.

THE proportion of alcohol is here so large, as indeed it is in most of the tinctures of this kind, that it is merely to be considered as a concealed dram.

TINCTURA CASTOREI. *Lond. Dub.**Tincture of Castor.*

Take of

Russian castor, powdered, two ounces ;

Proof spirit, two pints, (two pounds, *Dub.*)Digest for ten days, (seven, *Dub.*) and strain.*Edin.*

Take of

Russian castor, an ounce and a half ;

Alcohol, one pound.

Digest them for seven days, and strain through paper.

It has been disputed whether a weak or rectified spirit, and whether cold or warm digestion, are preferable for making this tincture.

From several experiments made to determine this question, it appears that castor, macerated without heat, gives out its finer and most grateful parts to either spirit, but most perfectly to the rectified : that heat enables both menstrua to extract the greatest part of its grosser and more nauseous matter : and that proof spirit extracts this last more readily than rectified.

The tincture of castor is recommended in most kinds of nervous complaints and hysteric disorders : in the latter, it sometimes does service, though many have complained of its proving ineffectual. The dose is from twenty drops to forty, fifty, or more.

Off. prep.—Tinct. sabinæ comp. *Lond.*TINCTURA CINCHONÆ OFFICINALIS. *Ed.* TINCTURACORTICIS PERUVIANI. *Dub. Lond.**Tincture of Cinchona, or Peruvian Bark.*

Take of

Cinchona bark, in powder, four ounces, (six ounces, *Lond.*)

Diluted alcohol, two pounds and a half, (two pounds, *Dub.* two pints, *Lond.*)

Digest for seven days, (eight days, *Lond.*) and strain through paper, *Ed.*)

THIS tincture is certainly impregnated with the virtues of cinchona, but not to such a degree that it can be given in sufficient doses to act as cinchona, without exhibiting more alcohol than what is proper to be given as a medicine. Indeed, we are afraid that this and other bitter and tonic tinctures, as they are called, are with some only an apology for dram drinking, and that the most apparent effects they produce are those of a slight degree of intoxication.

TINCTURA CINCHONÆ, SIVE CORTICIS PERUVIANI COMPOSITA. *Lond. Dub.*

Compound Tincture of Peruvian Bark.

Take of

Peruvian bark, powdered, two ounces;

Exterior peel of Seville oranges, dried, one ounce and a half, (half an ounce, *Dub.*)

Virg nian snake root, bruised, three drachms;

Saffron, one drachm;

(Cochineal, powdered, two scruples, *Lond.*)

Proof spirit, twenty ounces, (two pounds, *Dub.*)

Digest for fourteen days, and strain.

THIS is said to be the same with the celebrated *Huxham's Tincture of Bark.*

As a corroborant and stomachic, it is given in doses of two or three drachms: but when employed for the cure of intermittents, it must be taken to a greater extent.

TINCTURA CINNAMONI COMPOSITA; olim TINCTURA AROMATICA. *Ed.*

Compound Tincture of Cinnamon, formerly Aromatic Tincture.

Take of

Cinnamon, bruised,

Lesser cardamom seeds, bruised, each one ounce;

Long pepper, in powder, two drachms;

Diluted alcohol, two pounds and a half.

Digest for seven days, and filter through paper.

TINCTURA CINNAMOMI COMPOSITA. *Lond.* TINCTURA AROMATICA. *Dub.*
Aromatic Tincture.

Take of

Cinnamon, bruised, six drachms ;
 Lesser cardamom seeds, without the capsules, one drachm, (three drachms, *Lond.*)
 Long pepper, in powder,
 Ginger, in powder, two drachms ;
 Proof spirit, two pounds, (two pints, *Lond.*)
 Mix and digest for seven days, then strain.

IN their formula, the Dublin and London colleges diminish the quantity of cardamom seeds, and substitute for it a proportion of ginger. This makes no alteration on the virtues of the preparation, which is a very warm aromatic, too hot to be given without dilution. A tea spoonful or two may be taken in wine, or any other convenient vehicle, in languors, weakness of the stomach, flatulencies, and other similar complaints; and in these cases it is often employed with advantage.

O. prep.—Æther sulph. cum alcohole aromat.

TINCTURA COLOMBÆ. *Lond. Ed. Dub.*
Tincture of Colomba.

Colomba root, powdered, two ounces and a half, (two ounces, *Ed. Dub.*)

Proof spirit of wine, two pints.

Digest for eight days, (seven, *Ed. Dub.*) and filter through paper.

THIS is a very good stomachic tincture, which may be used when the stomach will not bear the colomba in powder.

TINCTURA CONVULVULI JALAPÆ. *Ed.* TINCTURA JALAPÆ. *Lond. Dub.*
Tincture of Jalap.

Take of

Jalap, in powder, three ounces, (eight ounces, *Lond. Dub.*)

Diluted alcohol, fifteen ounces, (two pints, *Lond.* two pounds, *Dub.*)

Digest them for seven days, (eight days, *Lond. Dub.*) and strain the tincture through paper.

ALCOHOL was formerly ordered for the preparation of this tinc-

ture ; but diluted alcohol is a preferable menstruum, as it dissolves the active constituents of the jalap as well as pure alcohol, and is less stimulating.

TINCTURA CROCI ANGLICI. *Ed.*

Tincture of Saffron.

Take of

English saffron, cut in shreds, one ounce ;

Diluted alcohol, fifteen ounces.

Digest for seven days, and strain through paper.

THE proof spirit is a very proper menstruum for extracting the medical virtues of the saffron, and affords a convenient mode of exhibiting that drug.

TINCTURA DIGITALIS PURPUREÆ. *Ed.*

Tincture of Foxglove.

Take of

The dried leaves of foxglove, one ounce ;

Diluted alcohol, eight ounces.

Digest for seven days, and strain through paper.

THIS tincture is a very powerful medicine, and contains the virtues of the foxglove in a very manageable form. It has been chiefly used to diminish the force of the circulation of the blood in hæmoptysis, and often with remarkable success. It has been also said to cure phthisis pulmonalis, but subsequent experience has not confirmed the first trials. Like every other form in which foxglove is given, it should be given in very small doses, at first, such as from ten to twenty drops, and cautiously increased.

TINTURA FERULÆ ASSÆ FOETIDÆ. *Ed.* TINC-

TURA ASSÆ FOETIDÆ. Dub. Lond.

Tincture of Assa foetida.

Take of

Assa foetida, four ounces ;

Alcohol, two pounds and a half, *Ed.* (Two pints, *Lond.*)

Digest for seven days, (six days, *Lond.*) and strain through paper.

Dub.

Take of

Assa foetida, four ounces ;

Rectified spirit of wine, two pounds ;

Water, eight ounces.

Add the spirit to the *assa foetida*, triturated with the water, and digest for eight days; then strain.

THIS tincture possesses the virtues of the *assa foetida* itself; and may be given in doses of from ten drops to fifty or sixty.

TINTURA GALBANI. *Lond.*

Tincture of Galbanum.

Take of

Galbanum, cut into small pieces, two ounces;

Proof spirit of wine, two pints.

Digest with a gentle heat for eight days, and strain.

THIS tincture, though not so powerful, is less nauseous than that of *assa foetida*, and therefore in some cases may be preferable.

TINCTURA GENTIANÆ COMPOSITA; vulgo ELIXIR STOMACHICUM. *Ed.*

Compound Tincture of Gentian, commonly called Stomachic Elixir.

Take of

Gentian root, sliced and bruised, two ounces;

Seville orange-peel, dried and bruised, one ounce;

Canella alba, bruised, half an ounce;

Cochineal, in powder, half a drachm;

Diluted alcohol, two pounds and a half.

Macerate for seven days, and strain through paper.

Lond.

Take of

Gentian root, sliced and bruised, two ounces;

Exterior dried peel of Seville oranges, one ounce;

Lesser cardamom seeds, husked and bruised, half an ounce;

Proof spirit of wine, two pints.

Digest for eight days, and strain.

THESE are very elegant spirituous bitters. As the preparations are designed for keeping, lemon peel, an excellent ingredient in the watery bitter infusions, has, on account of the perishableness of its flavour, no place in these. The aromatics are here very commodious ingredients, as in this spiritous menstruum they are free from the inconvenience with which they are attended in other liquors, of diminishing their transparency.

TINCTURA GUAIACI OFFICINALIS. *Ed.**Tincture of Guaiac.*

Take of

Gum guaiac, in powder, one pound ;

Alcohol, two pounds and a half.

Digest for ten days, and strain through paper.

WHAT is called gum guaiac is in fact a resin, and perfectly soluble in alcohol. This solution is a powerful stimulating sudorific, and may be given in doses of about half an ounce in rheumatic and arthritic cases. It was once supposed to be a specific against the gout.

TINCTURA HELLEBORI NIGRI. *Lond. Dub.**Tincture of Black Hellebore.*

Take of

Black hellebore, in coarse powder, four ounces ;

(Cochineal, powdered, two scruples, *Lond.*)

Proof spirit of wine, two pints, (two pounds, *Dub.*)

Digest with a gentle heat for eight days, (seven, *Dub.*) and strain.

Edin.

Take of

Black hellebore root, bruised, four ounces ;

Cochineal, in powder, half a drachm ;

Diluted alcohol, two pounds and a half.

Digest for seven days, and filter through paper.

THIS is perhaps the best preparation of hellebore, when designed for an alterative, the menstruum here employed extracting the whole of its virtues. It has been found, from experience, particularly serviceable in uterine obstructions. In sanguine constitutions, where chalybeates are hurtful, it has been said that it seldom fails of exciting the menstrual evacuations, and removing the ill consequences of their suppression. A tea spoonful of the tincture may be taken twice a-day in warm water or any other convenient vehicle.

TINCTURA HYOSCIAMI NIGRI. *Ed.**Tincture of Henbane.*

Take of

The leaves of henbane, dried, one ounce ;

Diluted alcohol, eight ounces.

Digest for seven days, and strain through paper.

THIS tincture, although not yet come into general use, is a valuable anodyne, and in many cases may be substituted with advantage for the tincture of opium, especially where the latter produces obstinate constipation, or, instead of its usual soporific and sedative effects, it causes uneasiness, restlessness, and universal irritation.

TINCTURA KINO. *Edin. Dub.*

Tincture of Kino.

Take of

Kino, in powder, two ounces ;

Diluted alcohol, a pound and a half.

Digest for seven days, and strain through paper.

We have already stated our reasons for believing kino to be a species of tannin. This is certainly a very astringent tincture, and will be found an excellent medicine in obstinate diarrhœas and in lenteria.

TINCTURA LAURI CINNAMOMI. *Ed.*

Tincture of Cinnamon.

Take of

Cinnamon, bruised, three ounces ;

Diluted alcohol, two pounds and a half.

Digest for seven days, and strain through paper.

TINCTURA CINNAMOMI. *Lond. Dub.*

Tincture of Cinnamon.

Take of

Cinnamon, bruised, one ounce and a half, (three ounces and a half, *Dub.*)

Proof spirit of wine, one pint, (two pints, *Dub.*)

Digest for ten days, and strain.

THE tincture of cinnamon possesses the astringent virtues of the cinnamon, as well as its aromatic cordial ones ; and in this respect it differs from the distilled waters of that spice.

TINCTURA LAVENDULÆ COMPOSITA. *Dub.* SPIRITUS

LAVENDULÆ SPICÆ COMPOSITUS. *Edin.*

Compound Tincture, or Spirit, of Lavender.

Take of

Spirit of lavender, three pounds ;

Spirit of rosemary, one pound ;

Cinnamon, bruised, one ounce, (half an ounce, *Dub.*)

Cloves, bruised, two drachms ;
 Nutmeg, bruised, half an ounce ;
 Red saunders wood, in shavings, three drachms ;
 Macerate for seven days, and filter.

SPIRITUS LAVENDULÆ COMPOSITA. *Lond.*
Compound Spirit of Lavender.

Take of

Spirit of lavender, three pints ;
 Spirit of rosemary, one pint ;
 Cinnamon, bruised,
 Nutmegs, bruised, of each half an ounce ;
 Red saunders, one ounce.

Digest for ten days, and strain.

THESE preparations do not differ materially. They are grateful cordials, of which from ten to a hundred drops may be conveniently taken dropt upon sugar. It does not appear very clearly whether they should be considered as spirits or tinctures; for although the spirit of lavender be the predominant ingredient, yet the mode of preparation is that of a tincture, and the spirit as a menstruum dissolves astringent, colouring, and other substances, which would not rise with it in distillation.

TINCTURA MELOES VESICATORII. *Ed.* TINCTURA
 CANTHARIDUM. *Dub.*
Tincture of Cantharides.

Take of

Cantharides, bruised, one drachm, (two drachms, *Dub.*)
 Diluted alcohol, one pound, (two pounds, *Dub.*)
 Digest for seven days, and strain through paper.

TINCTURA CANTHARIDIS. *Lond.*
Tincture of Spanish Flies.

Take of

Bruised cantharides, two drachms ;
 Cochineal, powdered, half a drachm ;
 Proof spirit, one pint and a half.
 Digest for eight days, and strain.

THIS tincture contains the active principle of the cantharides, whatever it may be. It is applied externally as a stimulant and rubefacient, and is sometimes given internally in doses of from ten to twenty drops, as a diuretic, or as a stimulant in gleets and gonorrhœa.

TINCTURA MIMOSÆ CATECHU ; olim **TINCTURA JAPONICA.** *Ed.* **TINCTURA CATECHU.** *Lond.*

Tincture of Catechu.

Take of

Extract of catechu, three ounces ;
Cinnamon, bruised, two ounces
Diluted alcohol, two pounds and a half, (two pints, *Lond.*)
Digest for seven days, (ten days, *Lond.*) and strain through paper.

THE cinnamon is a very useful addition to the catechu, not only as it warms the stomach, but likewise as it covers its roughness and astringency.

This tincture is of service in all kinds of defluxions, catarrhs, loosenesses, uterine fluxes, and other disorders, where astringent medicines are indicated. Two or three tea spoonfuls may be taken every now and then in red wine, or any other proper vehicle.

TINCTURA MOSCHI. *Dub.*

Tincture of Musk.

Take of

Musk, two drachms ;
Rectified spirit of wine, one pound.
Mix and macerate for seven days, and strain.

RECTIFIED spirit is the most complete menstruum for musk ; but in this form it is often impossible to give a sufficient quantity of the musk.

TINCTURA MYRRHÆ. *Ed. Lond. Dub.*

Tincture of Myrrh.

Take of

Myrrh, in powder, three ounces.
Alcohol, twenty ounces, (half a pint, *Lond.* two pounds, *Dub.*)
Proof spirit of wine, a pint and a half, *Lond.*
Water, ten ounces, *Ed.*
Digest for seven days, (eight days, *Lond.*) and strain through paper.

TINCTURE of myrrh is recommended internally as a cardiac, for removing obstructions, particularly those of the uterine vessels and resisting putrefaction. The dose is from fifteen drops to forty or more. The medicine may perhaps be given in these cases to advantage ; though with us, it is more commonly used

externally, for cleansing foul ulcers, and promoting the exfoliation of carious bones.

Off. prep.—Tinct. fabinæ. comp. *Lond.* Trochisci glycyrr. cum opio, *Dub.*

TINCTURA OPII, SIVE THEBAICA; vulgo LAUDANUM LIQUIDUM. *Ed. Dub.*

Tincture of Opium, or Thebaic Tincture, commonly called Liquid Laudanum.

Take of

Opium, two ounces;

Diluted alcohol, two pounds.

Digest for seven days, and filter through paper.

Lond.

Take of

Hard purified opium, powdered, ten drachms;

Proof spirit of wine, one pint.

Digest for ten days, and strain.

As these tinctures on evaporation furnish the same quantity of extract, they are believed to be of nearly equal strength, but it is to be regretted that they are not so well adapted for keeping as could be wished: after some time, a part of the opium is gradually deposited from both, and consequently the tinctures become weaker: the part which thus separates, amounts sometimes, as it is said to near one fourth of the quantity of opium at first dissolved.

TINCTURA OPII CAMPHORATA. *Lond.* olim ELIXIR PAREGORICUM. *Dub.*

Camphorated Tincture of Opium. Paregoric Elixir.

Take of

Hard purified opium,

Flowers of benzoin, of each, one drachm;

Camphor, two scruples;

Essential oil of aniseed, one drachm;

Proof spirit of wine, two pints.

Digest for ten days, (mix and macerate for seven days, *Dub.*) and strain.

IN this formula the virtues of the opium and camphor are combined. It gets an agreeable flavour from the acid of benzoin and essential oil. The latter will also render it more stimulating; but whether it derives any salutary virtues from the former, we do not know. It was originally prescribed under the title of Elixir Astmaticum, which it does not ill deserve. It contributes to allay

the tickling which provokes frequent coughing ; and at the same time it is supposed to open the breast, and give greater liberty of breathing. It is given to children against the chincough, &c. from five drops to twenty : to adults, from twenty to an hundred. Half an ounce, by measure, contains about a grain of opium.

TINCTURA RHEI PALMATI. *Ed.*

Tincture of Rhubarb.

Take of

Rhubarb, sliced, three ounces ;
 Lesser cardamom seeds, bruised, half an ounce ;
 Diluted alcohol, two pounds and a half.

Digest for seven days, and strain through paper.

TINCTURA RHABARBARI. *Lond. Dub.*

Tincture of Rhubarb.

Take of

Rhubarb, cut into pieces, two ounces ;
 Lesser cardamom seeds, bruised, (and husked, *Dub.*)
 Saffron, two drachms ;
 Proof spirit of wine, two pints, (two pounds, *Dub.*)

Digest for eight days, (seven days, *Dub.*) and strain.

TINCTURA RHABARBARI COMPOSITA. *Lond.*

Compound Tincture of Rhubarb.

Take of

Rhubarb, sliced, two ounces ;
 Liquorice root, bruised, half an ounce ;
 Ginger, powdered,
 Saffron, each two drachms ;
 Distilled water, one pint ;
~~Race~~ spirit of wine, twelve ounces, by measure.

Digest for fourteen days, and strain.

TINCTURA RHEI ET ALOES ; olim ELIXIR SACRUM. *Ed.*

Tincture of Rhubarb with Aloes, commonly called Sacred Elixir.

Take of

Rhubarb, sliced, ten drachms ;
 Socotorine aloes, in powder, six drachms ;
 Lesser cardamom seeds, bruised, half an ounce ;
 Diluted alcohol, two pounds and a half.

Digest for seven days, and strain through paper.

R r

TINCTURA RHEI ET GENTIANÆ; olim TINCTURA
RHEI AMARA. *Ed.*

Tincture of Rhubarb with Gentian, formerly Bitter Tincture of Rhubarb.

Take of

- Rhubarb, sliced, two ounces ;
- Gentian root, sliced, half an ounce ;
- Diluted alcohol, two pounds and a half.

Digest for seven days, and strain through paper.

ALL the foregoing tinctures of rhubarb are designed as stomachics and corroborants, as well as purgatives : spirituous liquors excellently extract those parts of the rhubarb in which the two first qualities reside, and the additional ingredients considerably promote their efficacy. In weakness of the stomach, indigestion, laxity of the intestines, diarrhœas, colic, and other similar complaints, these medicines are frequently of great service.

TINCTURA SABINÆ COMPOSITA. *Lond.*
Compound Tincture of Savin.

Take of

- Extract of savin, one ounce ;
- Tincture of castor, one pint ;
- myrrh, half a pint.

Digest till the extract of savin be dissolved, and then strain.

THIS preparation is improved from one described in some former Dispensatories under the name of Elixir Uterinum. It is said to be a medicine of great importance in uterine obstructions, and in hypochondriacal cases ; though, possibly, means might be contrived of superadding more effectually the virtues of savin to a tincture of myrrh and castor. It may be given from five drops to twenty or thirty, or more, in any suitable vehicle.

TINCTURA SAPONIS; vulgo LINIMENTUM SAPONACEUM.
Ed.

Tincture of Soap, formerly Saponaceous Liniment.

Take of

- Soap, in shavings, four ounces ;
- Camphor, two ounces ;
- Volatile oil of rosemary, half an ounce.
- Alcohol, two pounds.

Digest the soap in the alcohol for three days ; then add to the filtered liquor the camphor and the oil, agitating them diligently.

LINIMENTUM SAPONIS COMPOSITUM. *Lond.*

Compound Soap Liniment.

Take of

Soap, three ounces ;

Camphor, one ounce ;

Spirit of rosemary, one pint.

Digest the soap in the spirit of rosemary until it be dissolved, and add to it the camphor.

LINIMENTUM SAPONACEUM. *Dub.*

Saponaceous Liniment.

Take of

Castile soap, two ounces ;

Camphor, one ounce ;

Alcohol,

Water, each eight ounces ;

Essential oil of rosemary, two scruples.

Dissolve the soap in the water over a gentle fire ; strain the liquor through linen ; and when it is almost cold, add the camphor and oil dissolved in the alcohol.

Off. prep.—Linim volat. *Dub.*

TINCTURA SAPONIS ET OPII ; olim LINIMENTUM ANODYNUM. *Ed.*

Tincture of Soap with Opium, formerly Anodyne Liniment.

THIS is prepared in the same way, and from the same substances, as the simple tincture of soap, but with the addition from the beginning of

Opium one ounce.

THESE tinctures are only used externally, and possess great efficacy in removing local pains, when rubbed on the affected part.

TINCTURA SCILLÆ. *Lond. Dub.*

Tincture of Squill.

Take of

Squills, fresh dried, four ounces ;

Proof spirit of wine, two pints, (two pounds, *Dub.*)

(Digest for eight days, and pour off the liquor, *Lond.*)

(Mix and digest for seven days ; then remove from the fire, and when the feces have subsided, pour off the pure liquor, *Dub.*)

THE active principle of squills is soluble in alcohol, and there are cases in which a tincture may be useful.

TINCTURA SENNÆ COMPOSITA; vulgo ELIXIR SALUTIS. *Edin.*

Compound Tincture of Senna, commonly called Elixir of Health.

Take of

Senna leaves, two ounces;
Jalap root, bruised, one ounce;
Coriander seeds, bruised, half an ounce;
Diluted alcohol, three pounds and a half.

Digest for seven days, and to the liquor filtered through paper add,

Double refined sugar, four ounces.

TINCTURA SENNÆ. *Lond. Dub.*

Tincture of Senna.

Take of

Senna, one pound;
Caraway seeds, bruised, one ounce and a half;
Lesser cardamom seeds, bruised, (and hulked, *Dub.*) half an ounce.

Raisins, stoned, sixteen ounces;

Proof spirit, one gallon, (nine pounds, *Dub.*)

Digest for fourteen days, and strain.

BOTH these tinctures are useful carminatives and cathartics, especially to those who have accustomed themselves to the use of spiritous liquors; they often relieve flatulent complaints and colics, where the common cordials have little effect; the dose is from one to two ounces.

TINCTURA TOLUIFERÆ BALSAMI; olim TINCTURA TOLUTANA. *Edin.* TINCTURA BALSAMI TOLUTANI. *Lond. Dub.*

Tincture of the Balsam of Tolu.

Take of

Balsam of Tolu, an ounce and a half, (one ounce, *Dub.*)

Alcohol, one pound, (one pint, *Lond.*)

Digest until the balsam be dissolved; and then strain the tincture through paper.

THIS solution of balsam of Tolu possesses all the virtues of the

balsam itself. It may be taken internally, with the several intentions for which that balsam is proper, to the quantity of a tea spoonful or two in any convenient vehicle. Mixed with simple syrup, it forms an elegant balsamic syrup.

Off. prep.—Syrupus Tol. bals. *Ed.* Elect. catechu, *Dub.* Trochisci glycer. cum opio, *Ed.* *Dub.*

TINCTURA VALERIANÆ. *Lond.*

Tincture of Valerian.

Take of

The root of wild valerian, in coarse powder, four ounces ;

Proof spirit of wine, two pints.

Digest with a gentle heat for eight days, and strain.

THE valerian root ought to be reduced to a pretty fine powder, otherwise the spirit will not sufficiently extract its virtues. The tincture has a deep colour, and is strongly impregnated with the valerian ; though it has not been found to answer so well in the cure of epileptic disorders as the root in substance, exhibited in the form of powder or bolus. The dose of the tincture is from half a spoonful to a spoonful or more two or three times a-day.

TINCTURA VERATRI ALBI. *Ed.*

Tincture of White Hellebore.

Take of

White hellebore root, bruised, eight ounces ;

Diluted alcohol, two pounds and a half.

Digest them together for seven days, and filter the tincture through paper.

THIS tincture is sometimes used for assisting cathartics, &c. and as an emetic in apoplectic and maniacal disorders. It may likewise be so managed, as to prove a powerful alterative and deobstruent, in cases where milder remedies have little effect. But a great deal of caution is requisite in its use : the dose, at first, ought to be only a few drops ; if considerable, it proves violently emetic or cathartic.

TINCTURA ZINGIBERIS. *Lond.*

Tincture of Ginger.

Take of

Ginger, powdered, two ounces ;

Proof spirit, two pounds.

Digest in a gentle heat for eight days, and strain.

THIS tincture is cordial and stimulant, and is only employed as a corrigent to purgative draughts.

CHAP. XXXI.

TINCTURES made with ETHEREAL SPIRITS.

WE have classed these tinctures by themselves, because they are more strongly characterised by the nature of the menstruum than of the substances dissolved in it. Indeed, the ethereal spirits are used in these instances, not to dissolve bodies which would resist the action of alcohol and water, but for the sake of their own direct action on the body.

TINCTURA ALOES ÆTHEREA. *Ed.*

Ethereal Tincture of Aloes.

Take of

Socotorine aloes,

Myrrh, of each, in powder, one ounce and a half;

English saffron, sliced, one ounce;

Sulphuric ether with alcohol, one pound.

Digest the myrrh with the sulphuric ether with alcohol for four days, in a close vessel; then add the saffron and aloes.

Digest again for four days, and, when the feces have subsided, pour off the tincture.

THIS tincture agrees generally in its effects with the other tinctures of aloes, the only difference arising from the more penetrating and stimulating nature of the menstruum itself.

ÆTHER SULPHURICUS CUM ALCOHOLE AROMATICUS. *Edin.*

Aromatic Sulphuric Ether with Alcohol.

This is made of the same aromatics, and in the same manner, as the compound tincture of cinnamon; except, that, in place of alcohol, sulphuric ether with alcohol is employed.

THIS is designed for persons whose stomachs are too weak to bear the following acid tincture: to the taste, it is gratefully aromatic, without any perceptible acidity.

ACIDUM SULPHURICUM AROMATICUM. *Edin.*

Aromatic Sulphuric Acid.

Take of

Alcohol, two pounds ;

Sulphuric acid, six ounces ;

Drop the acid gradually into the alcohol. Digest the mixture with a very gentle heat in a close vessel for three days, and then add, of

Cinnamon, bruised, an ounce and a half ;

Ginger, bruised, one ounce.

Digest again in a close vessel for six days, and then filter the tincture through paper placed in a glass funnel.

ALTHOUGH the name given to this preparation by the college does not sanction its arrangement with the ethereal tinctures, yet we have ventured to place it here, from the belief that the alcohol is completely or partially changed, by the digestion with the acid, into an ethereal spirit, and that the principal difference between this and the preceding tincture consists in the presence of the acid, which is not to be considered as the menstruum by which the tincture is formed, but as an acid mixed with the ethereal tincture.

Med. use.—This is a valuable medicine in weakness and relaxations of the stomach, and decays of constitution, particularly in those which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromatics by themselves had availed nothing ; and, indeed, great part of its virtues depend on the sulphuric acid ; which, barely diluted with water, has, in those cases where the stomach could bear the acidity, produced happy effects.

It is very usefully conjoined with cinchona, and other tonic barks, both as covering their disagreeable taste, and as coinciding with them in virtue. It may be given in doses of ten to thirty drops, or more, several times a-day.

CHAP. XXXII.

AMMONIATED or VOLATILE TINCTURES.

AMMONIA, like ether, is so powerful an agent on the living system, that we think it gives a peculiar character to the compositions into which it enters. They are all highly stimulating and pungent, and apt to excite diaphoresis. As ammonia exerts considerable and peculiar powers as a solvent, these tinctures must never be combined in prescription with any thing acid, which would not only neutralize the ammonia, and destroy its peculiar action on the living system, but would precipitate whatever was dissolved by its agency.

LINIMENTUM CAMPHORÆ COMPOSITUM. *Lond.**Compound Camphor Liniment.*

Take of

Camphor, two ounces ;

Water of pure ammonia, six ounces ;

Spirit of lavender, sixteen ounces.

Mix the water of ammonia with the spirit ; and distil from a glass retort, with a slow fire, sixteen ounces. Then dissolve the camphor in the distilled liquor.

LINIMENTUM CAMPHORATUM. *Dub.**Camphorated Liniment.*

Take of

Camphor, three ounces ;

Ley of aerated volatile alkali, ten ounces ;

Spirit of lavender, two pounds.

Mix the ley and the spirit ; and distil from a glass retort, with a gentle heat, two pounds. Then dissolve the camphor in the distilled liquor.

THESE compositions are more pungent and penetrating than the solutions of camphor in alcohol. In the quarto impression of their Pharmacopœia, the London college employed the solution of carbonated ammonia, but changed it in the octavo edition for the

water of pure ammonia, which is certainly an improvement. Indeed I never made the experiment; but, from analogy, I should be inclined to think that the carbonated ammonia is incapable of dissolving the camphor.

LINIMENTUM VOLATILE. *Dub.*

Volatile Liniment.

Take of

The aromatic spirit of volatile alkali, one ounce;

Liniment of soap, two ounces;

Mix them.

THIS is an entirely different composition from the volatile liniment of the Edinburgh and London pharmacopœias. The latter is a soap formed of ammonia and fixed oil, whereas the present is an ammoniated tincture of camphor, soap of soda, and volatile oils. In its effects it differs from the soap-liniment of the Dublin college only in being more stimulating.

ALCOHOL AMMONIATUM AROMATICUM, SIVE SPIRITUS AMMONIÆ AROMATICUS. *Ed.*

Aromatic Ammoniated Alcohol, or Aromatic Spirit of Ammonia.

Take of

Ammoniated alcohol, eight ounces;

Volatile oil of rosemary, one drachm and a half;

Volatile oil of lemon-peel, one drachm.

Mix them that the oils may be dissolved.

SPIRITUS AMMONIÆ COMPOSITUS. *Lond.*

Compound Spirit of Ammonia.

Take of

Spirit of ammonia, two pints;

Essential oil of lemon,

————— cloves, of each two drachms;

Mix them.

SPIRITUS ALKALI VOLATILIS AROMATICUS. *Dub.*

Aromatic Spirit of Volatile Alkali.

Take of

Spirit of volatile alkali, two pounds;

Essential oil of lemon,

————— nutmeg, of each two drachms.

Mix them.

MEDICINES of this kind might be prepared extemporaneously, by dropping any proper volatile oil into ammoniated alcohol, which will readily dissolve the oil, if the ammonia in the solvent be caustic ; for if it be carbonated, such as it always is when prepared according to the directions of the London college, it does not dissolve the oils here ordered, and is therefore totally unfit for this preparation.

Med. use.—Ammonia thus united with aromatics, is not only more agreeable in flavour, but likewise more acceptable to the stomach, and less acrimonious than when uncombined. The dose is from five or six drops to sixty or more.

Off. prep.—Linim. volat. *Dub.* Tinct. cinchon. ammon. *Lond.* Tinctura guaiaci, *Lond. Dub.* Tinct. val. ammon. *Lond. Dub.*

SPIRITUS AMMONIÆ SUCCINATUS. *Lond.*

Succinated Spirit of Ammonia.

Take of

Alcohol, one ounce, by weight ;

Water of pure ammonia, four ounces, by measure ;

Rectified oil of amber, one scruple, by weight ;

Soap, ten grains.

Digest the soap and oil of amber in the alcohol till they be dissolved : then add the water of pure ammonia, and mix them by shaking.

THIS preparation is intended as a substitute for Eau de Luce, which was formerly imported entirely from Paris. It is now, we believe, prepared also by the chemists and druggists in London ; but without some peculiar manipulation, which is kept secret, the above formula does not succeed in giving the liquor that permanent milky opacity, which is deemed essential to good Eau de Luce, for it becomes more or less transparent by keeping. This fancied perfection, is, however, in a medical point of view, immaterial ; and whether it be opaque or transparent, it is an excellent analeptic remedy, and may be used in the same circumstances, and in the same doses, as the spirit of ammonia itself.

TINCTURA CASTOREI COMPOSITA. *Ed.*

Compound Tincture of Castor.

Take of

Russia castor, in powder, one ounce ;

Asa foetida, half an ounce ;

Ammoniated alcohol, one pound.

Digest for seven days, and filter through paper.

THIS composition is a medicine of real efficacy, particularly in hysterical disorders, and the several symptoms which accompany them. The spirit here used is an excellent menstruum, both for the castor and the assa foetida, and greatly adds to their virtues.

TINCTURA CINCHONÆ AMMONIATA. *Lond.*

Ammoniated Tincture of Cinchona.

Take of

Cinchona, powdered, four ounces;

Compound spirit of ammonia, two pints.

Digest in a close vessel for ten days, and strain.

WE are not acquainted with this tincture; but from our knowledge of the active principles of cinchona bark, we are not disposed to think it a very judicious preparation; for the nature of the menstruum is so stimulating, that little effect can be expected from any portion of the cinchona it is capable of dissolving.

TINCTURA GUAIACI AMMONIATA. *Ed.*

Ammoniated Tincture of Guaiac.

Take of

Resin of guaiac, in powder, four ounces;

Ammoniated alcohol, one pound and a half.

Digest for seven days, and filter through paper.

TINCTURA GUAIACI. *Lond.* TINCT. GUAIACI VOLATILIS. *Dub.*

Tincture of Guaiac. Volatile Tincture of Guaiac.

Take of

Gum guaiacum, four ounces;

Compound spirit of ammonia, a pint and a half, (one pound and a half, *Dub.*)

Digest for three days, and strain, *Lond.*

Mix and macerate for seven days, in a vessel closely covered, then filter, *Dub.*

THESE are very elegant and efficacious tinctures; the ammoniated spirit readily dissolving the resin, and at the same time promoting its medicinal virtue. In rheumatic cases, a tea, or even table, spoonful, taken every morning and evening in any convenient vehicle, particularly in milk, has proved of singular service.

TINCTURA OPII AMMONIATA; olim ELIXIR PAREGORICUM. *Ed.*

Ammoniated Tincture of Opium, formerly Paregoric Elixir.

Take of

Benzoic acid,
English saffron, sliced, of each three drachms;
Opium, two drachms;
Volatile oil of aniseed, half a drachm;
Ammoniated alcohol, sixteen ounces.

Digest for seven days, in a close vessel, and filter through paper.

THIS is a preparation of considerable efficacy in many spasmodic diseases, as chincough, &c. the ammonia removing the spasm immediately, while the opium tends to prevent its return. Each drachm contains about a grain of opium.

TINCTURA VALERIANÆ AMMONIATA. *Lond. Dub.*

Ammoniated Tincture of Valerian.

Take of

Wild valerian, in coarse powder, four ounces;
Compound spirit of ammonia, two pints.

Digest for eight days, (seven days, in a vessel closely covered, *Dub.*) and strain.

THE compound spirit of ammonia is here an excellent menstruum, and at the same time considerably promotes the virtues of the valerian, which in some cases wants assistance of this kind. The dose may be a tea spoonful or two.

CHAP. XXXIII.

MEDICATED WINES.

PARMENTIER has occupied thirty-two pages of the *Annales de Chimie*, to prove that wine is an extremely bad menstruum for extracting the virtues of medical substances. His argument, (for there is but one), is, that by the infusion of vegetable

substances in wine, its natural tendency to decomposition is so much accelerated, that at the end of the process, instead of wine, we have only a liquor containing the elements of bad vinegar. As a solvent, diluted alcohol perfectly supercedes the use of wine; and if we wish to use wine to cover the taste, or to assist the operation of any medicine, M. Parmentier proposes, that a tincture of the substance should be extemporaneously mixed with wine as a vehicle.

Notwithstanding this argument appears to us to have great weight, we shall give to the medicated wines, retained in the pharmacopœias, the characters they still generally possess.

VINUM ALOES SOCOTERINÆ; vulgo TINCTURA SACRA.
Ed.

Wine of Socoterine Aloes, commonly called Sacred Tincture.

Take of

Socotorine aloes, in powder, one ounce;
Lesser cardamom seeds, bruised,
Ginger, bruised, each one drachm;
Spanish white wine, two pounds.

Digest for seven days, stirring now and then, and afterwards strain.

VINUM ALOETICUM. *Dub.*
Aloetic Wine.

Take of

Socotorine aloes, four ounces;
Canella alba, two ounces;
Spanish white wine, four pounds.

Powder the aloes and canella alba separately, then mix and pour on the wine, afterwards digest for fourteen days, frequently shaking the vessel; and, lastly, filter the liquor.

VINUM ALOES. *Lond.*
Wine of Aloes.

Take of

Socotorine aloes, eight ounces;
Canella alba, two ounces;
Spanish white wine, six pints;
Proof spirit, two pints.

Powder the aloes and canella separately; mix them and pour on the wine and spirit: digest for fourteen days, now and then shaking them; and strain.

It is proper to mix white sand, cleansed from impurities, with the powder, in order to prevent the moistened aloes from sticking together.

THIS medicine has long been in great esteem, not only as a cathartic, but likewise as a stimulus.

It appears from long experience to be a medicine of excellent service. The dose, as a purgative, is from one to two ounces. It may be introduced into the habit, so as to be productive of excellent effects, as an alterant, by giving it in small doses, at proper intervals: thus managed, it does not for a considerable time operate remarkably by stool; but at length proves purgative, and occasions a lax habit of much longer continuance than that produced by the other common cathartics.

VINUM GENTIANÆ COMPOSITUM; vulgo VINUM
AMARUM. *Ed.*

Compound Wine of Gentian, commonly called Bitter Wine.

Take of

Gentian root, half an ounce;
Cinchona bark, one ounce;
Seville orange peel, dried, two drachms;
Canella alba, one drachm;
Diluted alcohol, four ounces;
Spanish white wine, two pounds and a half;

First pour the diluted alcohol on the root and barks sliced and bruised, and after twenty-four hours add the wine; then macerate for seven days, and strain.

THIS wine, which is a pleasant bitter, is intended as a substitute for the old *Tinctura ad Stomachicos*. Wines of this kind are sometimes introduced at the tables of epicures in Italy, to assist the stomach in digestion.

VINUM IPECACUANHÆ. *Lond. Dub.*

Wine of Ipecacuanba.

Take of

The root of ipecacuan, bruised, two ounces;
Spanish white wine, two pints, (two pounds, *Dub.*)

Digest for ten days, (seven days, *Dub.*) and strain.

Ed.

Take of

Ipecacuan, bruised, one ounce;
Spanish white wine, fifteen ounces.

Macerate for seven days, and filter through paper.

BOTH these wines are very mild and safe emetics, and equally serviceable in dysenteries, with the ipecacuanha in substance ; this root yielding nearly all its virtues to the Spanish white wine. The common dose is an ounce, more or less, according to the age and strength of the patient.

VINUM NICOTIANÆ TABACI. *Ed.**Tobacco Wine.*

Take of

The dried leaves of tobacco, one ounce ;

Spanish white wine, one pound.

Macerate for seven days, and strain the liquor through paper.

WINE seems to extract more fully the active principles of the tobacco than either water or spirit taken separately.

VINUM RHEI PALMATI. *Ed.**Rhubarb Wine.*

Take of

Rhubarb, sliced, two ounces ;

Canella alba, bruised, one drachm ;

Diluted alcohol, two ounces ;

Spanish white wine, fifteen ounces.

Macerate for seven days, and strain through paper,

VINUM RHABARBARI. *Lond.**Wine of Rhubarb.*

Take of

Sliced rhubarb, two ounces and a half ;

Lesser cardamom seeds, bruised and husked, half an ounce ;

Saffron, two drachms ;

Spanish white wine, two pints ;

Proof spirit, half a pint.

Digest for ten days, and strain.

By assisting the solvent power of the wine, the proof spirit in the above formulæ is a very useful addition. This is a warm, cordial, laxative medicine. It is used chiefly in weakness of the stomach and bowels, and some kinds of loosenesses, for evacuating the offending matter, and strengthening the tone of the viscera. It may be given in doses of from half a spoonful to three or four spoonfuls or more, according to the circumstances of the disorder, and the strength of the patient.

CHAP. XXXIV.

EXTRACTS and RESINS.

EXTRACT in pharmacy has long been used, in the common and true acceptation of the term, to express a thing extracted, and therefore it was applied to substances of all kinds which were extracted from heterogeneous bodies, by the action of any menstruum, and again reduced to a consistent form, by the evaporation of that menstruum. Lately, however, Extract has been used in a different and much more limited sense, as the name for a peculiar principle, which is often indeed contained in extracts, and which before had no proper appellation. It is in the former sense that we employ it here, and in which we wish it to be only used, while a new word should be invented as the name of the new substance. Till a better be proposed, we shall call it *extractive*.

Extracts are of various kinds, according to the nature of the substances from which they are obtained, and the menstruum employed; but they commonly consist of gum, sugar, extractive, tannin, cinchonin, gallic acid, or resin, or several of them mixed in various proportions. The menstrua most commonly employed are water and alcohol. The former is capable of extracting all the substances enumerated, except the resin, and the latter all except the gum. Wine is also sometimes employed, but very improperly; for as a solvent it can only act as a mixture of alcohol and water, and the principles which it leaves behind on evaporation are rather injurious than of advantage to the extract.

Water is the menstruum most economically employed in making extracts, as it is capable of dissolving all the active principles except resin, and can have its solvent powers assisted by a considerable degree of heat.

Watery extracts are prepared by boiling the subject in water, and evaporating the strained decoction to a thick consistence.

It is indifferent, with regard to the medicine, whether the subject be used fresh or dry; since nothing that can be preserved in this process will be lost by drying. With regard to the facility of extraction, however, there is a very considerable difference; veget-

ables in general giving out their virtues more readily when moderately dried than when fresh.

Very compact dry substances should be reduced into exceedingly small parts, previous to the affusion of the menstruum.

The quantity of water ought to be no greater than is necessary for extracting the virtues of the subject. This point, however, is not very easily ascertained; for although some of the common principles of extracts be soluble in a very small proportion of water, there are others, such as the tannin, of which water can dissolve only a certain proportion, and cannot be made to take up more by any length of boiling; besides we have no very good method of knowing when we have used a sufficient quantity of water; for vegetable substances will continue to colour deeply successive portions of water boiled with them, long after they are yielding nothing to it but colouring matter. Perhaps one of the best methods is to boil the subject in successive quantities of water, as long as the decoctions form a considerable precipitate with the test which is proper for detecting the substance we are extracting, such as a solution of gelatin for tannin, of alum for extractive, &c.

“ The decoctions are to be depurated by colature; and afterwards suffered to stand for a day or two, when a considerable quantity of sediment is usually found at the bottom. If the liquor poured off clear be boiled down a little, and afterwards suffered to cool again, it will depose a fresh sediment, from which it may be decanted before you proceed to finish the evaporation. The decoctions of very resinous substances do not require this treatment, and are rather injured by it; the resin subsiding along with the inactive dregs.”

Such were the directions given in the former editions of this work for the depuration of the decoctions, and we have inserted them at full length, because, although we doubt very much of their propriety, our reasons for so doing are scarcely more than hypothetical. We would advise the decoctions to be evaporated after they have been filtered boiling hot, without any further depuration; because some of the most active principles of vegetable substances, such as tannin, are much more soluble in boiling than in cold water, and because almost all of them are very quickly affected by exposure to the atmosphere. Therefore, if a boiling decoction, saturated with tannin, be allowed to cool, the greatest part of the very principle on which the activity of the substance depends will separate to the bottom, and according to the above directions, will be thrown away as sediment. The same objection applies more strongly to allowing the decoction to cool, and

EXTRACTA. *Lond.**Extracts.*

Boil the article in distilled water, press out the decoction, strain it and set it apart that the feces may subside; then boil it again in a water-bath saturated with sea salt to a consistence proper for making pills.

The same kind of bath is to be used in the preparation of all the extracts, that the evaporation may be properly performed.

EXTRACTA SIMPLICIORA. *Dub.**Simple Extracts.*

ALL simple extracts, unless otherwise ordered, are to be prepared according to the following rule :

The parts of the plants ordered are to be boiled in water ; the liquor is then to be expressed, and after the feces have subsided, it is to be filtered ; and lastly, it is to be evaporated with a gentle heat, and frequently stirred, until it acquire a consistence proper for forming pills.

In this manner are prepared,

EXTRACTA	Extracts of
<i>Radici</i> GLYCYRRHIZÆ GLABRÆ. <i>Ed.</i>	the roots of Liquorice
GLYCYRRHIZÆ. <i>Lond. Dub.</i>	
——— HELLEBORI NIGRI. <i>Ed.</i> }	——— Black Hel-
Dub. <i>Lond.</i> }	lebore.
<i>Radici</i> GENTIANÆ. <i>Lond. Dub.</i>	the roots of Gentian.
<i>Off. prep.</i> —Pulvis aloeticus cum ferro. <i>Lond.</i> Pil aloet. <i>Dub.</i>	
<i>Lond.</i> Pil stib. comp. <i>Dub.</i>	
——— JALAPÆ. <i>Dub.</i>	——— Jalap.
<i>Foliorum</i> RUTÆ GRAVEOLENTIS. <i>Ed.</i>	Leaves of Rue.
RUTÆ. <i>Lond. Dub.</i>	
——— CASSIÆ SENNÆ. <i>Ed.</i>	——— Senna.
——— SABINÆ. <i>Lond. Dub.</i>	——— Savin.
<i>Off. prep.</i> —Tinct. Sabinæ comp. <i>Lond.</i>	
<i>Florum</i> ANTHEMIDIS NOBILIS. <i>Ed.</i>	{ of the flowers of Chamomile.
CHAMÆMELI. <i>Lond. Dub.</i>	

EXTRACTA

Extracts

Capium PAPAVERIS SOMNIFERI.

{ of the heads of White
Poppy.

PAPAVERIS ALBI. *Lond.*

Cacuminum GENISTÆ. *Lond.*

Broom tops.

Ligni HÆMATOXYLI CAMPECH. *Ed.*

Logwood.

HÆMATOXYLI. *Dub.*

Corticis QUERCUS. *Dub.*

Oak bark.

Gummi resina ALOES.

Aloes.

EXTRACTUM CINCHONÆ, SIVE CORTICIS PERUVIANI. *Lond.*

Extract of Cinchona, or Peruvian Bark.

Take of

Peruvian bark, in coarse powder, one pound ;

Distilled water, twelve pints.

Boil for an hour or two, and pour off the liquor, which, while hot, will be red and pellucid, but, as it grows cold, will become yellow and turbid. The same quantity of water being again poured on, boil the bark as before, and repeat the boiling until the liquor, on becoming cold, remains clear. Then reduce all these liquors, mixed together and strained, to a proper thickness, by evaporation.

This extract must be prepared under two forms ; one *soft*, and fit for making pills ; the other *hard* and pulverisable.

EXTRACTUM CORTICIS PERUVIANI DURUM. *Dub.*

Hard Extract of Peruvian Bark.

Take of

Peruvian bark, in coarse powder, one pound ;

Water, twelve pounds.

Mix and boil to the half ; then strain the liquor still boiling. What remains upon the filter is to be again boiled with fresh affusions of water, as often as may be necessary. Lastly, evaporate all the decoctions, mixed and filtered, after they have cooled, until the extract become so hard as to be reducible to powder.

EXTRACTUM CORTICIS PERUVIANI MOLLE. *Dub.*

Soft Extract of Peruvian Bark.

This is prepared in the same manner, except that the extract is made no drier than to render it fit for the formation of pills.

**EXTRACTUM HÆMATOXYLI, SIVE LIGNI CAMPE-
CHENSIS. Lond.***Extract of Logwood.*

Take of

Shavings of logwood, one pound.

Boil it four times, or oftener, in a gallon of distilled water, to one half; then boil all the liquors, mixed and strained, down to a proper consistence.

EXTRACTUM OPII. Dub.*Extract of Opium.*

Take of

Purified opium, two ounces;

Boiling water, one pound.

Melt the opium in the water, and to the liquor strained, while it is warm, add one pound of cold distilled water. Expose this liquor for two days to the air, filter it again, and, lastly, evaporate it to the consistence of an extract over a very gentle fire.

EXTRACTUM SENNÆ. Lond.*Extract of Senna.*

Take of

Senna, one pound;

Distilled water, one gallon.

Boil the senna in the distilled water, adding after its decoction a little rectified spirit of wine. Evaporate the strained liquor to a proper thickness.

Dub.

Take of

Senna, one pound;

Water, eight pounds;

Rectified spirit of wine, eight ounces;

Boil the senna in the water to one half; add the spirit to the decoction after it is cold, and digest in a covered vessel for twenty-four hours, then express the liquor, and evaporate it to a proper thickness over a very gentle fire.

EXTRACTS made with ALCOHOL and WATER.

EXTRACTUM CINCHONÆ OFFICINALIS. *Ed.*

Extract of Cinchona.

Take of

Cinchona bark, in powder, one pound ;

Alcohol, four pounds.

Digest for four days, and pour off the tincture.

Boil the residuum in five pounds of distilled water for fifteen minutes, and filter the decoction boiling hot through linen. Repeat this decoction and filtration with the same quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey.

Draw off the alcohol from the tincture by distillation, until it also become thick ; then mix the liquors, thus inspissated, and evaporate them in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

EXTRACTUM CONVULVULI JALAPÆ. *Ed.*

Extract of Jalap

Is prepared in the same way, from the bruised root.

EXTRACTUM CORTICIS PERUVIANI CUM RESINA.

Lond.

Extract of Peruvian Bark with the Resin.

Take of

Peruvian bark, reduced to coarse powder, one pound ;

Rectified spirit of wine, four pints.

Digest it for four days, and pour off the tincture ; boil the residuum in ten pints of distilled water to two ; then strain the tincture and decoction separately, evaporating the water from the decoction, and distilling off the spirit from the tincture, until each begins to be thickened. Lastly, mix the resinous with the aqueous extract, and make the mass fit for forming into pills.

In the same way are prepared

EXTRACTUM CASCARILLÆ. *Lond. Extract of Cascarilla.*

EXTRACTUM JALAPII. *Lond. Extract of Jalap.*

Off. prep.—Pulv. scam. comp. *Lond.* Pulv. scam. cum aloë, *Lond.*

EXTRACTUM CASCARILLÆ RESINOSUM. *Dub.*
Resinous Extract of Cascarilla.

Take of

Cascarilla, in coarse powder, one pound ;

Rectified spirit of wine, four pounds.

Digest for four days, then pour off the tincture and strain ; boil the residuum in twelve pounds of water to two, and purify this liquor in the same way as the former. Evaporate the decoction, and distil the tincture till both begin to grow thick ; and lastly, mix them well together.

In this way are prepared,

EXTRACTUM CORTICIS PERUVIANI RUBRI RESINOSUM. *Dub.*
Resinous Extract of Red Peruvian Bark.

EXTRACTUM VALERIANÆ SYLVESTRIS RESINOSUM. *Dub.*
Resinous Extract of Wild Valerian.

EXTRACTUM COLOCYNTHIDIS COMPOSITUM. *Lond.*
Compound Extract of Coloquintida.

Take of

Pith of coloquintida, cut small, six drachms ;

Socotorine aloes, powdered, an ounce and a half ;

Scammony, powdered, half an ounce ;

Smaller cardamom seeds, husked and powdered, one drachm ;

Proof spirit, one pint.

Digest the coloquintida in the spirit, with a gentle heat, during four days. To the expressed tincture add the aloes and scammony ; when these are dissolved, draw off the spirit by distillation, and evaporate the water, adding the seeds towards the end of the process, so as to form an extract fit for making into pills.

OPIUM PURIFICATUM. *Lond. Dub.*
Purified Opium.

Take of

Opium, cut into small pieces, one pound ;

Proof spirit of wine, twelve pints.

Digest the opium with a gentle heat, stirring now and then till it be dissolved, and filter through paper. Distil the tincture, so prepared, to a proper thickness, (for making into pills, *Dub.*) (Purified opium must be kept in two forms : one *soft*, proper for forming into pills ; the other *hard*, which may be reduced into powder, *Lond.*)

Off. prep.—Extract. opii, *Dub.* Pulv. cret. cum opio, *Lond.*
Pulv. ipec. et opii, *Lond. Dub.* Pulv. opiat, *Lond.*

THE chapter on extracts and resins in the London Pharmacopœia is concluded with the two following general directions :

1. All the extracts, during the time of inspissation, must be gently agitated.
2. On all the softer watery extracts, a small quantity of spirit of wine must be sprinkled.

All these extracts are supposed to contain the virtues of the substances from which they are prepared, in a very pure and concentrated form : but this supposition is, probably in several instances, erroneous ; and the directions for preparing them are frequently injudicious and uneconomical.

As the changes which opium and aloes undergo by solution, and subsequent evaporation, have never been ascertained by careful and satisfactory experiments, well selected pieces of these substances are to be preferred to the preparations in which they are supposed to be purified.

Cinchona bark is a medicine of very great importance ; but unfortunately the proportion of woody fibres, or inert matter, which enter into its composition is so great, that weak stomachs cannot bear it, when given in quantity sufficient to produce any very powerful effects. On this account, the preparation of an extract, which may contain its active principles in a concentrated form, becomes also an object of importance. On this subject there is still much room for experiment. The London and Dublin colleges, in their directions, certainly err in two important particulars ; in the first place, in desiring the decoction to be continued until the greatest part of the menstruum is evaporated ; and, in the second place, in separating by filtration the powder which separates from the decoction after it has cooled. The first error probably originated in the idea, that by continuing the boiling for a great length of time more of the bark would be dissolved ; but it is now known, that water is incapable of dissolving more than a certain

quantity of the active principles of cinchona : and that after the water has become saturated, by continuing the decoction we diminish the quantity of the menstruum, and therefore also diminish the quantity of bark dissolved. It is not easy to account for the second error ; for, according to the old idea, that the powder which separated on cooling from a saturated decoction of cinchona, was a resinous substance, it surely ought not to have been rejected from what were supposed to be resinous extracts. This precipitate is now known to be caused by the much greater solubility of its active principles in boiling, than in cold water, so that the precipitate is not different from what remains in solution. Accordingly I have found by experiment, that cinchona gave at least one half more extract when the decoction was conducted according to the directions of the Edinburgh college.

The real advantage of so expensive an agent as alcohol, in preparing any of these extracts, has not been demonstrated ; and, if I be not misinformed, it is seldom employed by the apothecaries in preparing even what are called the Resinous Extracts.

RESINA FLAVA. *Lond. Dub.*

Yellow Rosin.

This remains in the retort after the distillation of oil of turpentine.

TURPENTINES are combinations of volatile oil and resins, which are easily separated by distillation. The process, however, cannot be carried so far as to separate the whole of the oil, without charring and burning the resin. In this state it has a brown colour and a certain degree of transparency ; and is well known under the name of Fiddlers rosin. But, if water be added to the residuum of the distillation, and be thoroughly mixed with it by agitation, it becomes opaque, and is called Yellow Rosin.

“ Yellow rosin is a useful ingredient in the composition of plasters and hard ointments.

AMMONIACI PURIFICATIO. *Lond.*

The Purification of Gum Ammoniacum.

If gum ammoniac do not seem to be pure, boil it in water till it become soft ; then squeeze it through a canvass bag, by means of a press. Let it remain at rest till the resinous part subside ; then evaporate the water ; and towards the end of the evaporation, mix the resinous part with the gummy.

In the same manner are purified *assa fœtida* and similar gum resins.

You may also purify any gum which melts easy, such as *Galbanum*, by putting it in an ox bladder, and holding it in boiling

water till it becomes so soft that it can be separated from its impurities by pressing it through a coarse linen cloth.

As one, and perhaps the most active constituent of gummy resins, as they are called, is of a volatile nature, it is evident that it must be in a great measure dissipated in the process just described, and that we cannot expect the same virtues in these substances after they are purified, which they possess in their crude state. This process is therefore contrary to the principles of good pharmacy: and such specimens of these gummy resins as stand in need of it to give them an apparent degree of purity, should not be admitted into the shop of the apothecary. Besides, many of the impurities which they usually contain, are easily separated in compounding the preparations or extemporaneous prescriptions into which they enter.

STYRAX PURIFICATA. *Lond. Dub.*
Purified Storax.

Dissolve the storax in rectified spirit of wine, and strain the solution; afterwards reduce it to a proper thickness with a gentle heat.

STORAX is a balsam or combination of resin and benzoic acid, both of which are soluble in alcohol, and neither of them volatile in the heat necessary for evaporating alcohol. The process for purifying it is therefore not liable to any chemical objections.

CHAP. XXXV.

P O W D E R S.

THIS form is proper for such materials only as are capable of being sufficiently dried to become pulverisable, without the loss of their virtue. There are several substances, however, of this kind, which cannot be conveniently taken in powder; bitter, acrid, fetid, drugs are too disagreeable; emollient and mucilaginous herbs and roots are too bulky; pure gums cohere, and become tenacious in the mouth; fixed alkaline salts deliquesce when ex-

posed to the air ; and volatile alkalies exhale. Many of the aromatics, too, suffer a great loss of their odorous principles when kept in powder ; as in that form they expose a much larger surface to the air.

The dose of powders, in extemporaneous prescription, is generally about half a drachm ; it rarely exceeds a whole drachm : and is not often less than a scruple. Substances which produce powerful effects in small doses are not exhibited in this form, unless their bulk be increased by additions of less efficacy ; those which require to be given in larger ones are better fitted for other forms.

The usual vehicle for taking the lighter powders, is any agreeable thin liquid. The ponderous powders, particularly those prepared from metallic substances, require a more consistent vehicle, as syrups ; for from thin ones they soon subside : Resinous substances likewise are most commodiously taken in thick liquors ; for in thin ones, they are apt to run into lumps, which are not easily again soluble.

PULVIS ALOES CUM CANELLA. *Lond.*

Powder of Aloes with Canella.

Take of

Socoterine aloes, one pound ;

White canella, three ounces.

Powder them separately, and then mix them.

THIS was formerly well known by the title of Hiera Picra. The spicy canella acts as a corrigent to the aloes, but the compound is more adapted to be formed into pills, than to be used in the state of powder.

PULVIS ALOETICUS CUM GUAIACO. *Lond.*

Aloetic powder with Guaiacum.

Take of

Socotorine aloes, one ounce and a half ;

Gum guaiacum, one ounce ;

Aromatic powder, half an ounce.

Rub the aloes and gum guaiacum separately to powder ; then mix them with the aromatic powder.

THIS powder is supposed to combine the sudorific effects of the guaiac with the purgative of the aloes.

PULVIS ALOETICUS CUM FERRO. *Lond.**Aloetic Powder with Iron.*

Take of

Socotorine aloes, an ounce and a half ;
 Myrrh, two ounces ;
 Dry extract of gentian ,
 Vitriolated iron, of each one ounce ;
 Reduce them separately to powder, and mix them.

THIS combination is sufficiently judicious, as in some cases the combined effects of an aloetic and chalybeate prove of very great advantage. But powder is a bad form of exhibiting aloes ; we would therefore recommend it to be formed into pills or boluses, with a little mucilage.

PULVIS AROMATICUS. *Lond. Dub.**Aromatic Powder.*

Take of

Cinnamon, two ounces ;
 Smaller cardamom seeds, husked ;
 Ginger,
 Long pepper, of each one ounce.
 Rub them together to a powder, (which is to be kept in a well corked phial, *Dub.*)

Edin.

Take of

Cinnamon,
 Smaller cardamom seeds,
 Ginger, each equal parts.
 Reduce them to a very fine powder, which is to be kept in a glass vessel well closed.

BOTH of these compositions are agreeable, hot, and spicy, and may be usefully taken in cold phlegmatic habits and decayed constitutions, for warming the stomach, promoting digestion, and strengthening the tone of the viscera. The dose is from ten grains to a scruple and upwards. The first is considerably the warmest, from the quantity of long pepper which it contains.

Off. prep.—Pulvis aloet. cum guaiac, *Lond.* Elect. aromat. *Ed.*
 Elect. opiat. *Ed.*

PULVIS ASARI COMPOSITUS. *Lond. Dub.**Compound Powder of Asarabacca.*

Take of

Asarabacca,

Sweet marjoram,
 Syrian herb-mastich,
 Lavender, of each, dried, one ounce.

Reduce them together to powder, which is to be kept in a closed phial.

Ed.

Take of

The leaves of asarabacca, three parts.

———— marjoram,

Flowers of lavender, of each one part.

Rub them together to powder.

THEY are both agreeable and efficacious errhines, and superior to most of those usually sold under the name of *herb snuff*. They are often employed with great advantage in cases of obstinate headach, and of ophthalmias resisting other modes of cure. Taken under the form of snuff to the extent of five or six grains at bedtime, they will operate the succeeding day as a powerful errhine, inducing frequent sneezing, and likewise a copious discharge from the nose. It is, however, necessary, during their operation, to avoid exposure to cold,

PULVIS CHELARUM CANCRI COMPOSITUS. *Lond.*
Compound Powder of Crabs Claws.

Take of

Crabs claws, prepared, one pound ;

Chalk,

Red coral, each, prepared, three ounces.

Mix them.

THE invention of this formula must be ascribed solely to the unphilosophical idea, that the sum of the powers of medicines was increased by mixing them together ; for the present powder is a mixture of three varieties of carbonate of lime, which, notwithstanding the immense differences of their prices, do not differ in their effects.

Off. prep.—Pulv. contrayerv. comp. *Lond.* Confectio aromat. *Lond.*

PULVIS CARBONATIS CALCIS COMPOSITUS ; olim
 PULVIS CRETACEUS. *Edin.*

Compound Powder of Carbonate of Lime, formerly Chalk Powder.

Take of

Prepared carbonate of lime, four ounces ;

Nutmeg, half a drachm ;

Cinnamon, one drachm and a half.
Reduce them together to powder.

PULVIS CRETÆ COMPOSITUS. *Lond.*
Compound Powder of Chalk.

Take of
Prepared chalk, half a pound;
Cinnamon, four ounces;
Tormentil,
Gum arabic, of each three ounces;
Long pepper, half an ounce.
Powder them separately, and mix them.

THE addition of the aromatics coincides with the general intention of the remedy, which is indicated in weakness and acidity in the stomach, and in looseness from acidity.

PULVIS CRETÆ COMPOSITUS CUM OPIO. *Lond.*
Compound Powder of Chalk with Opium.

Take of
Compound powder of chalk, eight ounces;
Hard opium, powdered, one drachm and a half.
Mix them.

THE addition of the opium renders this a more powerful remedy than the carbonate of lime alone, especially where the diarrhoea proceeds from irritation of the intestinal canal.

PULVIS CERUSSÆ COMPOSITUS. *Lond.*
Compound Powder of Ceruse.

Take of
Ceruse, five ounces;
Sarcocoll, an ounce and a half;
Tragacanth, half an ounce.
Powder them together.

THIS is employed for external purposes, as in collyria, lotions, and injections for repelling acrimonious humours, and in inflammation; but for all these purposes it is very inferior to solutions of acetate of lead.

PULVIS CONTRAYERVÆ COMPOSITUS. *Lond.*
Compound Powder of Contrayerva.

Take of
Contrayerva, powdered, five ounces;

Compound powder of crabs claws, one pound a half.
Mix them.

THIS medicine has a very good claim to the title of an alexipharmic and sudorific. The contrayerva by itself proves very serviceable in low fevers, where the vis vitæ is weak, and a diaphoresis to be promoted. It is possible, that the crabs claws are of no farther service, than as they divide this active ingredient, and make it fit more easily on the stomach.

PULVIS IPECACUANHÆ ET OPII. *Edin.* PULVIS IPECACUANHÆ COMPOSITUS; olim PULVIS DOVERI. *Lond. Dub.*
Powder of Ipecacuan and Opium, or Compound Powder of Ipecacuan, formerly Dover's Powder.

Take of

Ipecacuan, in powder,

Opium, (purified, *Dub.* hard purified, *Lond.*) of each one part;

Sulphate of potass, eight parts.

Triturate them together into a fine powder.

THE sulphate of potass, from the grittiness of its crystals, is perhaps better fitted for tearing and dividing the tenacious opium than any other salt; this seems to be its only use in the preparation. The operator ought to be careful that the opium and ipecacuanha be equally diffused through the whole mass of powder, otherwise different portions of the powder must have differences in degree of strength.

This powder is one of the most certain sudorifics, and as such, was recommended by Dr. Dover, as an effectual remedy in rheumatism. Modern practice confirms its reputation, not only in rheumatism, but also in dropsy and several other diseases, where it is often difficult by other means to produce a copious sweat. The dose is from five to twenty grains, according as the patient's stomach and strength can bear it. It is proper to avoid much drinking immediately after taking it, otherwise it is very apt to be rejected by vomiting before any other effects are produced.

PULVIS JALAPÆ COMPOSITUS. *Edin.*
Compound Powder of Jalap.

Take of

Jalap root, in powder one part;

Super-tartrate of potass, two parts.

Grind them together to a very fine powder.

THE use of the crystals in this preparation, is to break down

and divide the jalap; and therefore they are directed to be triturated together, and not separately.

PULVIS MYRRHÆ COMPOSITUS. *Lond.*

Compound Powder of Myrrh.

Take of
Myrrh,
Dried favin,
—— rue,
Russian castor, of each one ounce.
Rub them together into a powder.

THIS is a reformation of the Trochisci Myrrhæ, a composition contrived by Rhazes against uterine obstructions. From a scruple to a drachm, or more, two or three times a-day, may be taken in any convenient vehicle, or made into boluses.

PULVIS OPIATUS. *Lond.*

Opiate Powder.

Take of
Hard purified opium, powdered, one drachm;
Burnt and prepared hartshorn, nine drachms.
Mix them.

Edin.

Take of
Opium, one part;
Prepared carbonate of lime, nine parts.
Rub them together to a fine powder.

IN these powders the opium is the active ingredient; and it is immaterial whether the phosphate or carbonate of lime be used to promote its mechanical division.

PULVIS SCAMMONII COMPOSITUS. *Lond.*

Compound Powder of Scammony.

Take of
Scammony,
Hard extract of jalap, of each two ounces;
Ginger half an ounce.
Powder them separately, and mix them.

Edin.

Take of
Scammony,

Super-tartrite of potash, equal parts.
Rub them together to a very fine powder.

Dub.

Take of
Scammony,
Vitriolated vegetable alkali, each two ounces;
Ginger, half an ounce.
Powder them separately and then mix them.

IN the first of these compositions, the scammony is combined with another purgative more active than itself, and in the others, with one much less so; which difference must be attended to in prescription. The ginger is an useful addition, and will render it less apt to gripe.

PULVIS SCAMMONII COMPOSITUS CUM ALOE. *Lond.*
Compound Powder of Scammony with Aloes.

Take of
Scammony, six drachms;
Hard extract of jalap,
Socotorine aloes, of each, an ounce and a half;
Ginger, half an ounce.
Powder them separately, and mix them.

HERE we have a combination of three powerful purgatives of the same kind, but what advantage these compositions have over the ingredients taken separately, is not very apparent. Of the present, from five to ten grains is a sufficient dose.

PULVIS SCAMMONII CUM CALOMELANE. *Lond.*
Powder of Scammony with Calomel.

Take of
Scammony, half an ounce;
Calomel,
Double refined sugar, of each two drachms,
Powder them separately, and then mix them.

IN this case the calomel may often be found to be an useful addition to the scammony, as its mode of action is different, although it coincides with it in the general effect.

PULVIS SENNÆ COMPOSITUS. *Lond.*
Compound Powder of Senna,

Take of
Senna,

Crystals of tartar, of each two ounces;
 Scammony, half an ounce;
 Ginger, two drachms.
 Triturate the scammony by itself, reduce the rest together into a powder, and then mix them all.

THIS powder is given as a cathartic, in the dose of two scruples, or a drachm. The scammony is used as a stimulus to the sen-
 na; the quantity of the latter necessary for a dose, when not as-
 sisted by some more powerful material, being too bulky to be
 conveniently taken in this form. The ginger is added to make
 it sit easier on the stomach and gripe less.

PULVIS SULPHATIS ALUMINÆ COMPOSITUS; olim
 PULVIS STYPTICUS. *Ed.*

Compound Powder of Sulphate of Alumina, formerly Styptic Powder.
 Take of

Sulphate of alumina, four parts;
 Kino, one part.
 Rub them together to a fine powder.

THIS powder is composed of two very powerful astringents,
 but which we believe are not combined with propriety; at least,
 it is certain that a solution of alum is decomposed by a solution
 of kino.

PULVIS TRAGACANTHÆ COMPOSITUS. *Lond.*
Compound Powder of Tragacanth.

Take of
 Tragacanth powdered,
 Gum arabic,
 Starch, of each an ounce and a half;
 Double refined sugar, three ounces.
 Rub them together into a powder.

THIS composition is a mild emollient; and hence, becomes
 serviceable in hectic cases, tickling coughs, strangury, some
 kinds of alvine fluxes, and other disorders proceeding from a thin
 acrimonious state of the excreted fluids, or an abrasion of the
 mucus of the intestines; it is supposed to soften, and give a great-
 er degree of consistency to the former, and defend the latter from
 being irritated or excoriated by them. All the ingredients coin-
 cide in these general intentions. The dose is from half a drachm
 to two or three drachms, which may be frequently repeated.

CHAP. XXXVI.

CONSERVES.

CONSERVES are compositions of recent vegetable matters and sugar, beaten together into an uniform mass.

This management is introduced for preserving certain simples, undried, in an agreeable form, with as little alteration as possible in their native virtues; and in some cases it is very advantageous. Vegetables, whose virtues are lost or destroyed in drying, may in this form be kept uninjured for a considerable time; for by carefully securing the mouth of the containing vessel, the alteration, as well as dissipation, of their active principles, is generally prevented; and the sugar preserves them from the corruption which juicy vegetables would otherwise undergo.

The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. Rose buds, and some other vegetables, are prepared for mixing with sugar by a small wooden mill contrived for that purpose.

There are, however, vegetables whose virtues are impaired by this treatment. Mucilaginous substances, by long lying with sugar, become less glutinous; and astringents sensibly become softer upon the palate. Many of the fragrant flowers are of so tender and delicate a texture, as almost entirely to lose their peculiar qualities on being beaten or bruised.

In general, it is obvious, that in this form, on account of the large proportion of sugar, only substances of considerable activity can be taken with advantage as medicines. And, indeed, conserves are at present considered chiefly as auxiliaries to medicines of greater efficacy, or as intermediums for joining them together. They are very convenient for reducing into bolusses or pills the more ponderous powders, as submuriate of mercury, the oxides of iron, and other mineral preparations; which, with liquid or less consistent matters, as syrups, will not cohere.

The shops were formerly encumbered with many conserves altogether insignificant; the few now retained have in general either an agreeable flavour to recommend them, or are capable of answering some useful purposes as medicines. Their common dose is the bulk of a nutmeg, or as much as can be taken up at once or twice upon the point of a knife. There is, in general, no great danger of exceeding in this particular.

CONSERVÆ

Conserves of

orticis exterioris recentis fructus
CITRI AURANTII, *radula abrafi.*
Ed.

Orange Peel, obtained by rasp-
ing off the outer rind of the
fresh fruit.

AURANTII HISPALENSIS. *Lond.*

CORTICIS AURANTII. *Dub.*

Off. prep—Elect. aromat. *Dub.*

Fructus ROSÆ CANINÆ maturi, a
feminibus eorumque pube sollicitè
purgati. Ed.

Hips, from the ripe fruit, after
the seeds and down have been
carefully picked out.

CYNOSBATI. *Lond.*

Petalorum ROSÆ GALLICÆ, non-
dum explicitorum. Ed.

Red rose buds.

ROSÆ RUBRÆ. *Lond.*

ROSÆ. *Dub.*

Off. prep—Pit. hydrarg. *Ed. Lond.*

ABSYNTHII MARITIMÆ. *Lond.*

Conserve of sea wormwood.

ACETOSELLÆ. *Dub.*

Conserve of wood sorrel.

LUJULÆ. *Lond.*

Pluck the leaves from the stalks, the unblown petals from the cups, cutting off the heels. Rasp off the outer rind of the oranges by a grater.

When prepared, beat them with a wooden pestle in a marble mortar, first by themselves, afterwards with three times their weight of double refined sugar, until they be mixed.

THE only exceptions to these general directions, which are those of the London college, are, that the London college adds only twenty ounces of sugar to one pound of the pulp of hips, and that the Dublin add only twice their weight of sugar to the sorrel leaves. La Grange says, that by infusing the red rose leaves in four times their weight of water, which is afterwards to be expressed from them, they lose their bitterness, and are more easily reduced to a pulp, which he then mixes with a thick syrup, prepared by dissolving the sugar in the expressed liquor, and boiling it down to the consistence of an electuary.

It is scarcely necessary to make any particular remarks on these conserves. Their taste and virtues are compounded of those of sugar, and the substance combined with it. The wood sorrel and hips are acidulous and refrigerant, the orange-rind and wormwood bitter and stomachic, and the red rose buds astringent.

CONSERVA ARI. *Lond.**Conserve of Arum.*

Take of

Fresh root of arum, bruised, half a pound;

T t 2

Double refined sugar, a pound and a half.
Beat them together in a mortar.

THIS is one of the best forms for exhibiting this simple, as its virtues are destroyed by drying, and are not extracted by any menstruum. It may be given to adults in doses of a drachm.

CONSERVA PRUNI SILVESTRIS. *Lond.*

Conserve of Sloes.

Put the sloes in water upon the fire, that they may soften, taking care that they be not broken; then take them out of the water, press out the pulp, and mix it with three times its weight of double refined sugar into a conserve.

THIS preparation is a gentle astringent, and may be given as such in the dose of two or three drachms.

CONSERVA SCILLÆ. *Lond.*

Conserve of Squills.

Take of

Fresh squills, one ounce;

Double refined sugar, five ounces.

Beat them together in a mortar into a conserve.

THIS is a very uncertain and disagreeable mode of exhibiting this valuable simple.

The London college conclude their chapter on conserves with desiring all the conserves, especially those of arum and squills, to be kept in close vessels.

CHAP. XXXVII.

ELECTUARIES and CONFECTIONS.

ELECTUARIES are composed chiefly of powders mixed up with syrups, &c. into such a consistence, that the powders may not separate in keeping, that a dose may be easily taken up on the point of a knife, and not prove too stiff to swallow.

Electuaries are chiefly composed of the milder alterative medicines, and such as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like (except in officinal electuaries to be dispensed by weight), are seldom exhibited in this form, on account of the uncertainty of the dose: unpleasant ones, acrids, bitters, fetids, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous substances, as mercurials, these being apt to subside on keeping, unless the composition be made very stiff.

The lighter powders require thrice their weight of honey, or of syrup boiled to the thickness of honey, to make them into the consistence of an electuary: of syrups of the common consistence, twice the weight of the powder is sufficient.

Where common syrups are employed, the compound is apt to candy and dry too soon: electuaries of Peruvian bark, for instance, made up with syrup alone, will often in a day or two grow too dry for taking. This is owing to the crystallization of the sugar. Deyeux, therefore, advises electuaries, confections, and conserves, to be made up with syrups from which all the crystallizable parts have been separated. For this purpose, after being sufficiently evaporated, they are to be exposed to the heat of a stove as long as they form any crystals. The syrup which remains, probably from the presence of some vegetable acid, has no tendency to crystallize, and is to be decanted and evaporated to a proper consistence. In hospital practice, the same object may be obtained much more easily by using molasses instead of syrups, and in private practice, by the substitution of a little conserve.

The quantity of an electuary directed at a time in extemporaneous prescription varies much, according to its constituent parts; but is rarely less than the size of a nutmeg, or more than two or three ounces.

ELECTUARIUM AROMATICUM. *Ed.*

Aromatic Electuary.

Take of

Aromatic powder, one part;

Syrup of orange peel, two parts.

Mix and beat them well together, so as to form an electuary.

Dub.

Take of

Conserve of orange-peel, three ounces;

Cinnamon,

Nutmeg, of each, in powder, half an ounce;

Ginger, in powder,

Saffron, of each two drachms ;
 Double refined sugar, one ounce ;
 Syrup of orange-peel, as much as may be necessary to form the whole into an electuary, by beating them well together.

CONFECTIO AROMATICA. *Lond.*

Aromatic Confection.

Take of

Zedoary, in coarse powder,
 Saffron, of each half a pound ;
 Distilled water, three pints.

Macerate for twenty-four hours ; then press and strain. Reduce the strained liquor, by evaporation, to a pint and a half ; to which add

Compound powder of crabs claws, sixteen ounces ;
 Cinnamon,
 Nutmeg, of each two ounces ;
 Cloves, one ounce ;
 Smaller cardamom seeds, half an ounce ;
 Double refined sugar, two pounds.

Reduce the aromatics together to a very fine powder, and form them into a confection, by adding the sugar.

THESE compositions are sufficiently grateful, and moderately warm. They are given in the form of a bolus, in doses of from five grains to a scruple, or upwards, as a cordial, or as a vehicle for more active substances. The simple composition of the Edinburgh college serves all these purposes as well as the complicated formula of the London college.

ELECTUARIUM CASSIÆ FISTULÆ. *Ed.*

Electuary of Cassia.

Take of

Pulp of cassia fistularis, four parts ;
 Pulp of tamarinds,
 Manna, each one part ;
 Syrup of pale roses, four parts.

Having beat the manna in a mortar, dissolve it with a gentle heat in the syrup ; then add the pulps, and evaporate with a regularly continued heat to a proper consistence.

ELECTUARIUM CASSIÆ. *Lond. Dub.*

Electuary of Cassia.

Take of

The fresh extracted pulp of cassia, half a pound ;
 Manna, two ounces ;

Pulp of tamarinds, one ounce ;

Rose syrup, half a pound.

Boil the manna, and dissolve it over a slow fire in the rose syrup ; then add the pulps ; and, with a continued heat, evaporate the whole to the proper thickness of an electuary.

THESE compositions are very convenient officinals, to serve as a basis for purgative electuaries, and other similar purposes. The tamarinds give them a pleasant acidity, and do not, as might be expected, dispose them to ferment. After standing for four months, the composition has been found no sourer than when first made. This electuary is usefully taken by itself, to the quantity of two or three drachms occasionally, for gently loosening the belly in costive habits.

ELECTUARIUM CASSIÆ SENNÆ ; olim ELECTUARIUM
LENITIVUM. *Ed.*

Electuary of Senna, commonly called Lenitive Electuary.

Take of

Senna, eight ounces ;

Coriander seeds, four ounces ;

Liquorice root bruised, three ounces ;

Figs,

Pulp of prunes, each one pound ;

—— tamarinds, half a pound ;

Double refined sugar, two pounds and a half.

ELECTUARIUM SENNÆ. *Lond.*

Electuary of Senna.

Take of

Senna, eight ounces ;

Coriander seeds, four ounces ;

Liquorice, three ounces ;

Figs, one pound ;

Pulp of tamarinds,

—— cassia,

—— prunes, each half a pound.

Double refined sugar, two pounds and a half.

Powder the senna with the coriander seeds, and sift out ten ounces of the mixed powder ; boil the remainder with the figs and liquorice, in four pounds of water to one half ; express and strain the liquor, which is then to be evaporated, to the weight of about a pound and a half ; dissolve the sugar in it ; add this syrup by degrees to the pulps ; and lastly, mix in the powder.

Dub.

Take of

Senna leaves, in very fine powder, four ounces ;

Pulp of French prunes, one pound ;

——— tamarinds, two ounces ;

Molasses, a pound and a half ;

Essential oil of carraway, two drachms.

Boil the pulps in the syrup to the thickness of honey ; then add the powders, and when the mixture is cooled, add the oil ; then beat them all well together, so as to form an electuary.

THIS electuary is a very convenient laxative, and has long been in common use among practitioners. Taken to the size of a nutmeg or more, as occasion may require, it is an excellent laxative for loosening the belly in costive habits. The formula of the Dublin college is much more simple and elegant than the other.

ELECTUARIUM MIMOSÆ CATECHU ; olim CONFECTIO JAPONICA. Ed.

Electuary of Catechu, commonly called Japonic Confection.

Take of

Extract of mimosa catechu, four ounces ;

Kino, three ounces ;

Cinnamon,

Nutmeg, each one ounce ;

Opium, diffused in a sufficient quantity of Spanish white wine, one drachm and a half ;

Syrup of red roses, boiled to the consistence of honey, two pounds and a quarter.

Reduce the solids to powder ; and having mixed them with the opium and syrup, make them into an electuary.

ELECTUARIUM CATECHU COMPOSITUM ; olim CONFECTIO JAPONICA. Dub.

Compound Electuary of Catechu, formerly Japonic Confection.

Take of

Catechu, four ounces ;

Cinnamon,

Nutmeg, each one ounce ;

Kino, three ounces ;

Purified opium, diffused in a sufficient quantity of Spanish white wine, a drachm and a half ;

Syrup of ginger,

Syrup of orange peel, of each, evaporated to the consistence of honey, fourteen ounces ;

Tincture of Tolu, two drachms.
Mix them, so as to form an electuary.

THESE electuaries, which do not differ in any material particular, are extremely useful astringent medicines, and are often given in doses of a tea spoonful, frequently repeated, in cases of diarrhœa, &c. Ten scruples contain one grain of opium.

ELECTUARIUM SCAMONII. *Lond. Dub.*
Electuary of Scammony.

Take of
Scammony, in powder, one ounce and a half;
Cloves,
Ginger, of each six drachms;
Essential oil of caraway, half a drachm;
(Syrup of roses, as much as is sufficient, *Lond.*) (syrup of orange-peel, *Dub.*)
Mix the spices, powdered together with the syrup; then add the scammony, and lastly the oil of caraway.

THIS electuary is a warm brisk purgative. A drachm and a half contain fifteen grains of scammony.

ELECTUARIUM OPIATUM; olim ELECTUARIUM
THEBAICUM. *Edin.*

Opiate Electuary, commonly called Thebaic Electuary.

Take of
Aromatic powder, six ounces;
Virginian snake root, in fine powder, three ounces;
Opium, diffused in a sufficient quantity of Spanish white wine,
half an ounce;
Syrup of ginger, one pound.
Mix them, and form an electuary.

CONFECTIO OPIATA. *Lond.*
Confection of Opium.

Take of
Hard purified opium, powdered, six drachms;
Long pepper,
Ginger,
Caraway seeds, of each two ounces;
Syrup of white poppy, boiled to the consistence of honey, three times the weight of the whole.
Mix the purified opium with the syrup heated; then add the other ingredients rubbed to powder.

THE action which these electuaries will produce on the living system, is abundantly apparent from the nature of their ingredients. They are combinations of aromatics with opium; one grain of opium being contained in thirty-six of the London confection, and in forty-three of the Edinburgh electuary.

CHAP. XXXVIII.

TROCHES.

TROCHES and lozenges are composed of powders made up with glutinous substances into little cakes, and afterwards dried. This form is principally made use of for the more commodious exhibition of certain medicines, by fitting them to dissolve slowly in the mouth, so as to pass by degrees into the stomach, or to act upon the pharynx and top of the trachea; and hence these preparations have generally a considerable proportion of sugar, or other materials grateful to the palate. Some powders have likewise been reduced into troches, with a view to their preservation; though possibly for no very good reasons; for the moistening, and afterwards drying them in the air, must rather tend to injure than to preserve them.

TROCHISCI CARBONATIS CALCIS. *Ed.*

Troches of Carbonate of Lime.

Take of

Carbonate of lime, prepared, four ounces;

Gum arabic, one ounce;

Nutmeg, one drachm;

Double refined sugar, six ounces.

Powder them together, and form them with water into a mass for making troches.

TROCHISCI CRETÆ. *Lond.*

Troches of Chalk.

Take of

Chalk, prepared, four ounces;

Crabs claws, prepared, two ounces;

Cinnamon, half an ounce;

Double refined sugar, three ounces.

Powder them, and make them into troches with mucilage of gum arabic.

THESE are used against acidity of the stomach, especially when accompanied with diarrhœa.

TROCHISCI GLYCYRRHIZÆ GLABRÆ. *Ed.*

Troches of Liquorice.

Take of

Extract of liquorice,

Gum arabic, each one part;

White sugar, two parts.

Dissolve them in warm water, and strain: then evaporate the solution over a gentle fire till it be of a proper consistence for being formed into troches.

TROCHISCI GLYCYRRHIZÆ. *Lond. Dub.*

Troches of Liquorice.

Take of

Extract of liquorice,

Double refined sugar, of each ten (six *Dub.*) ounces;

Tragacanth, powdered, three (two *Dub.*) ounces.

Powder them thoroughly, and make them into troches with rose water.

THESE are both agreeable pectorals, and may be used at pleasure in tickling coughs. The latter of these two receipts is the easiest and best mode of making these troches. Refined extract of liquorice should be used; and it is easily powdered in the cold, after it has been laid for some days in a dry and rather warm place. The solution and subsequent evaporation directed by the Edinburgh college is exceedingly troublesome, and apt to give them an empyreumatic flavour.

TROCHISCI GLYCYRRHIZÆ CUM OPIO. *Ed.*

Liquorice Troches with Opium.

Take of

Opium, two drachms;

Tincture of Tolu, half an ounce;

Common syrup, eight ounces;

Extract of liquorice, softened in warm water,

Gum arabic, in powder, of each five ounces.

Triturate the opium well with the tincture, then add by degrees the syrup and extract; afterwards gradually mix in the pow-

dered gum arabic. Lastly, dry them so as to form a mass, to be divided into troches, each weighing ten grains.

TROCHISCI GLYCYRRHIZÆ COMPOSITI. *Dub.*
Compound Troches of Liquorice.

Take of

Purified opium, two drachms ;
Balsam of Peru, one drachm ;
Tincture of myrrh, three drachms.

Triturate the opium in the balsam and tincture mixed, until it be perfectly dissolved ; then gradually add of

Tincture of Tolu, two drachms ;
Extract of liquorice, softened in warm water, nine ounces.

Beat them together thoroughly, gradually adding of

Gum arabic, in powder, five ounces, and form the mass into troches, weighing ten grains each.

THESE directions for preparing the above troches are so full and particular, that no further explanation is necessary. Six of the Dublin troches, and seven and a half of the Edinburgh, contain about one grain of opium. These troches are medicines of approved efficacy in tickling coughs depending on an irritation of the fauces. Besides the mechanical effect of the viscid matters in involving acrid humours, or lining and defending the tender membranes, the opium no doubt must have a considerable share, by more immediately diminishing the irritability of the parts themselves.

TROCHISCI GUMMOSI. *Edin.*
Gum Troches.

Take of

Gum arabic, four parts ;
Starch, one part ;
Double refined sugar, twelve parts.

Powder them, and make them into a proper mass with rose water, so as to form troches.

TROCHISCI AMYLI. *Lond.*
Troches of Starch.

Take of

Starch, one ounce and a half ;
Liquorice, six drachms ;
Florentine orris, half an ounce ;
Double refined sugar, one pound and a half.

Powder them, and by means of mucilage of gum tragacanth, make troches. They may be also made without the orris.

THESE compositions are very agreeable pectorals, and may be used at pleasure. They are calculated for allaying the tickling in the throat which provokes coughing.

TROCHISCI MAGNESIÆ. Lond.*Troches of Magnesia.*

Take of

Burnt magnesia, four ounces ;
Double refined sugar, two ounces ;
Ginger, powdered, one scruple.

Triturate them together, and, with the addition of the mucilage of gum arabic, make troches.

THESE are excellent antacids, and at the same time tend to keep the bowels open.

TROCHISCI NITRATIS POTASSÆ. Ed.*Troches of Nitrate of Potass.*

Take of

Nitrate of potass, one part ;
Double refined sugar, three parts.

Rub together to powder, and form them with mucilage of gum tragacanth into a mass, to be divided into troches.

TROCHISCI NITRI. Lond.*Troches of Nitre.*

Take of

Purified nitre, powdered, four ounces ;
Double refined sugar, powdered, one pound ;
Tragacanth, powdered, six drachms.

With the addition of water, make troches.

THIS is a very agreeable form for the exhibition of nitre ; though, when the salt is thus taken without any liquid, (if the quantity be considerable), it is apt to occasion uneasiness about the stomach, which can only be prevented by large dilution with aqueous liquors.

TROCHISCI SULPHURIS. Lond.*Troches of Sulphur.*

Take of

Washed flowers of sulphur, two ounces ;
Double refined sugar, four ounces.

Rub them together, with a sufficient quantity of the mucilage of quince seeds, and make troches.

THIS composition is to be considered only as an agreeable form for the exhibition of sulphur, no alteration or addition being here made to its virtues.

CHAP. XXXIX.

PILLS.

To this form are peculiarly adapted those drugs which operate in a small dose, and whose nauseous and offensive taste or smell require them to be concealed from the palate.

Pills should have the consistence of a firm paste, a round form, and a weight not exceeding five grains. Essential oils may enter them in small quantity: deliquescent salts are improper. Efflorescent salts, such as carbonate of soda, should be previously exposed, so as to fall to powder: deliquescent extracts should have some powder combined with them. The mass should be beaten until it become perfectly uniform and plastic. Powders may be made into pills with extracts, balsams, soap, mucilages, bread crumb, &c.

Gummy resins, and inspissated juices, are sometimes soft enough to be made into pills, without addition: where any moisture is requisite, spirit of wine is more proper than syrups or conserves, as it unites more readily with them, and does not sensibly increase their bulk. Light dry powders require syrup or mucilages: and the more ponderous, as the mercurial and other metallic preparations, thick honey, conserve, or extracts.

Light powders require about half their weight of syrup; or of honey, about three fourths their weight; to reduce them into a due consistence for forming pills. Half a drachm of the mass will make five or six pills of a moderate size.

Gums and inspissated juices, are to be first softened with the liquid prescribed; the powders are then to be added, and the whole beat thoroughly together, till they be perfectly mixed.

The masses for pills are best kept in bladders, which should be moistened now and then with some of the same kind of liquid that the mass was made up with, or with some proper aromatic oil.

When the mass is to be divided into pills, a given weight of it is rolled out into a cylinder of a given length, and of an equal thickness throughout, and is then divided into a given number of equal pieces, by means of a simple machine. These pieces are then rounded between the fingers; and, to prevent them from adhering, they are covered either with starch, or powder of liquorice, or orris root. In Germany the powder of lycopodium is much used.

PILULÆ ALOETICÆ. *Ed.*

Aloetic Pills.

Take of

Aloes, in powder,

Soap, equal parts.

Beat them with simple syrup into a mass fit for making pills.

Dub.

Take of

Barbadoes aloes, in powder, one ounce;

Extract of gentian, half an ounce;

Ginger, in powder, two drachms;

Beat them together, and form a mass with jelly of soap, (gelatina saponis.)

PILULÆ ALOES COMPOSITÆ. *Lond.*

Compound Pills of Aloes.

Take of

Socotorine aloes, powdered, one ounce;

Extract of gentian, half an ounce;

Oil of caraway seeds, two scruples;

Syrup of ginger, as much as is sufficient.

Beat them together.

ALTHOUGH soap can scarcely be thought to facilitate the solution of the aloes in the stomach, as was supposed by Boerhaave and others, it is probably the most convenient substance that can be added to give it the proper consistence for making pills. When extract of gentian is triturated with aloes, they re-act upon each other, and become too soft to form pills, so that the addition of any syrup to the mass is perfectly unnecessary, unless at the same time some powder be added to give it consistency, as is done by the Dublin college. These pills have been much used as warm and stomachic laxatives: they are very well suited for the costiveness so often attendant on people of sedentary lives. Like other preparations of aloes, they are also used in jaundice, and in certain

cases of obstructed menses. They are seldom used for producing full purging; but if this be required, a scruple or half a drachm of the mass may be made into pills of a moderate size for one dose.

PILULÆ ALOES ET ASSÆ FÆTIDÆ. Ed.

Pills of Aloes and Assa Fætida.

Take of

Socotorine aloes, in powder,

Assa fætida,

Soap, equal parts.

Form them into a mass with mucilage of gum arabic.

THESE pills, in doses of about ten grains, twice a day, produce the most salutary effects in cases of dyspepsia, attended with flatulence and costiveness.

PILULÆ ALOES CUM COLOCYNTHIDE. Ed.

Pills of Aloes with Colocynth.

Take of

Socotorine aloes,

Scammony, of each eight parts;

Colocynth, four parts;

Oil of cloves,

Sulphate of potash with sulphur, of each one part.

Reduce the aloes and scammony into a powder with the salt; then let the colocynth, beat into a very fine powder, and the oil, be added; lastly, make it into a proper mass with mucilage of gum arabic.

THIS is more powerful in its operation than the simpler aloetic pills.

PILULÆ ALOES ET MYRRHÆ. Ed.

Take of

Socotorine aloes, four parts;

Myrrh, two parts;

Saffron, one part.

Beat them into a mass with simple syrup.

Lond.

Take of

Socotorine aloes, two ounces;

Myrrh,

Saffron, of each one ounce;

Syrup of saffron, as much as is sufficient.

Powder the aloes and myrrh separately; and afterwards beat all the ingredients together into a mass.

THESE pills have long continued in practice, without any other alteration than in the syrup with which the mass is made up, and in the proportion of saffron. The virtues of this medicine may be easily understood from its ingredients. Given to the quantity of half a drachm, or two scruples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives.

PILULÆ ASSÆ FŒTIDÆ COMPOSITÆ. *Ed.*

Compound Pills of Assa Fœtida.

Take of

Assa fœtida,

Galbanum,

Myrrh, each eight parts;

Rectified oil of amber, one part.

Beat them into a mass with simple syrup.

PILULÆ GALBANI COMPOSITÆ. *Lond.*

Compound Pills of Galbanum.

Take of

Galbanum,

Opopanax,

Myrrh,

Sagapenum, of each one ounce;

Assa fœtida, half an ounce;

Syrup of saffron, as much as is sufficient.

Beat them together.

THESE pills are designed for anti-hysterics and emmenagogues, and are very well calculated for answering those intentions; half a scruple, a scruple, or more, may be taken every night, or oftener.

PILULÆ AMMONIARETI CUPRI. *Ed.*

Pills of Ammoniacet of Copper.

Take of

Ammoniacet of copper, in fine powder, sixteen grains;

Bread crumb, four scruples;

Water of carbonate of ammonia, as much as may be sufficient.

Beat them into a mass, to be divided into thirty-two equal pills.

EACH of these pills weighs about three grains, and contains somewhat more than half a grain of the ammoniacet of copper. They seem to be the best form of exhibiting this medicine.

PILULÆ HYDRARGYRI. *Ed.*
Mercurial Pills.

Take of

Purified quicksilver,
Conserve of red roses, of each one ounce ;
Starch, two ounces.

Triturate the quicksilver with the conserve in a glass mortar, till the globules completely disappear, adding occasionally a little mucilage of gum arabic ; then add the starch, and beat the whole with a little water into a mass, which is to be immediately divided into four hundred and eighty equal pills.

Lond.

Take of

Purified quicksilver, two drachms ;
Conserve of roses, three drachms ;
Liquorice, finely powdered, one drachm.

Rub the quicksilver with the conserve until the globules disappear ; then, adding the liquorice powder, mix them together.

Dub.

Take of

Quicksilver,
Extract of liquorice, each three drachms ;
Liquorice root, in fine powder, a drachm and a half ;

Triturate the quicksilver with the extract of liquorice, reduced with warm water to the consistence of honey, until its globules disappear entirely ; then add the powder of liquorice, and as much water as shall be sufficient to form it into a mass.

THE common mercurial pill is one of the best preparations of mercury, and may, in general, supersede most other forms of this medicine. In its preparation the mercury is minutely divided, and probably converted into the black oxide. To effect its mechanical division, it must be triturated with some viscid substance. Soap, resin of guaiac, honey, extract of liquorice, manna, and conserve of roses, have all been at different times recommended. The soap and guaiac have been rejected on account of their being decomposed by the juices of the stomach ; and the honey, because it was apt to gripe some people. With regard to the others, the grounds of selection are not well understood ; perhaps the acid contained in the conserve of roses may contribute to the extinction of the mercury. We learn when the mercury is completely extinguished, most easily, by rubbing a very little of the mass with the point of

the finger on a piece of paper, if no globules appear. As soon as this is the case, it is necessary to mix with the mass a proportion of some dry powder, to give it a proper degree of consistency. For this purpose, powder of liquorice root has been commonly used, but it is extremely apt to become mouldy, and to cause the pills to spoil. The Edinburgh college have, therefore, with great propriety, substituted for it starch, which is a very inalterable substance, and easily procured at all times in a state of purity. It is necessary to form the mass into pills immediately, as it soon becomes hard. One grain of mercury is contained in four grains of the Edinburgh mass, in three of the London, and in two and a half of the Dublin. The dose of these pills must be regulated by circumstances; from two to six five-grain pills may be given daily.

PILULÆ OPII. *Lond.*

Pills of Opium.

Take of

Hard purified opium, powdered, two drachms;

Extract of liquorice, one ounce.

Beat them until they are perfectly united.

PILULÆ OPIATÆ; olim PILULÆ THEBAICÆ. *Ed.*

Opiate or Thebaic Pills.

Take of

Opium, one part;

Extract of liquorice, seven parts;

Jamaica pepper, two parts.

Soften the opium, and extract separately with diluted alcohol, and having beat them into a pulp, mix them: then add the pepper reduced to a powder; and lastly, having beat them well together, form the whole into a mass.

It is unfortunate that these two compositions should differ so much in strength; the former containing two, and the latter only one grain of opium, in ten of the mass. Under the idea that opium is to operate as a sedative, the addition of the pepper is somewhat injudicious. The London title also is ambiguous, as it is naturally employed for pills of opium without any addition.

PILULÆ RHEI COMPOSITÆ. *Ed.*

Compound Pills of Rhubarb.

Take of

Rhubarb, in powder, one ounce;

Socotorine aloes, six drachms ;
 Myrrh, half an ounce ;
 Volatile oil of peppermint, half a drachm.

Make them into a mass, with a sufficient quantity of syrup of orange peel.

THIS pill is intended for moderately warming and strengthening the stomach, and gently opening the belly. A scruple of the mass may be taken twice a-day.

PILULÆ SCILLÆ. *Lond.* PILULÆ SCILLITICÆ. *Dub.*
Squill Pills.

Take of

Fresh dried squills, powdered, one drachm ;
 Ginger, powdered,
 Soap, of each three drachms ;
 Ammoniacum, two drachms ;
 Syrup of ginger, as much as is sufficient.

Beat them together, (and form a mass with jelly of soap, *Dub.*)

PILULÆ SCILLITICÆ. *Edin.*
Squill Pills.

Take of

Dried root of squills, in fine powder, one scruple ;
 Gum ammoniac,
 Lesser cardamom seeds, in powder,
 Extract of liquorice, each one drachm.

Form them into a mass with simple syrup.

THESE are elegant and commodious forms for the exhibition of squills, whether for promoting expectoration, or with the other intentions to which that medicine is applied. As the virtue of the compound is derived chiefly from the squills, the other ingredients are often varied in extemporaneous prescription.

PILULÆ STIBII COMPOSITÆ ; olim PILULÆ PLUMMERI.
Dub.

Compound Antimonial Pills, formerly Plummer's Pills.

Take of

Precipitated sulphur of antimony,
 Mild muriate of mercury, each three drachms ;
 Extract of gentian,
 Hard Spanish soap, each one drachm.

Let the mercury be triturated with the sulphur ; then add the extract, and form a mass with jelly of soap.

THESE pills were recommended to the attention of the public about forty years ago, by Dr. Plummer, whose name they long bore. He represented them in a paper which he published in the Edinburgh medical essays as a very useful alterative; and on his authority they were at one time much employed; but they are now less extensively used than formerly.

CHAP. XL.

CATAPLASMS.

CATAPLASMA ALUMINIS. Lond.

Cataplasim of Alum.

COAGULUM ALUMINOSUM. Dub.

Alum Curd.

Take of

The white of two eggs, (any quantity, *Dub.*)

Shake them with a piece of alum till they be coagulated.

THIS preparation is taken from Riverius. It is an useful astringent epithem for sore moist eyes. Where the complaint is violent, this preparation, after the inflammation has yielded a little to bleeding, is one of the best external remedies. It is to be spread on lint, and applied at bed-time.

CATAPLASMA CUMINI. Lond.

Cataplasim of Cummin.

Take of

Cummin seed, one pound;

Bay berries,

Dry leaves of water germander, or scordium,

Virginian snake root, of each three ounces;

Cloves, one ounce.

Rub them all altogether to powder; and, with the addition of three times the weight of honey, make a cataplasm.

THIS was intended as a reformation of the *Theriaca Londinensis*, which for some time past has been scarcely otherwise used than as a warm cataplasm. In place of the numerous articles which formerly entered that composition, only such of its ingredients are retained as were supposed to contribute most to this intention.

CATAPLASMA SINAPEOS. *Lond.* CATAPLASMA SINAP-
PIUM. *Dub.*

Mustard Cataplasm.

Take of

Mustard seed, powdered,

Crumb of bread, of each half a pound;

Vinegar, as much as is sufficient.

Mix, and make a cataplasm.

CATAPLASMS of this kind are commonly known by the name of *Sinapisms*. They were formerly frequently prepared in a more complicated state, containing garlic, black soap, and other similar articles; but the above simple form will answer every purpose which they are capable of accomplishing. They are employed only as stimulants: they often inflame the part and raise blisters, but not so perfectly as cantharides. They are frequently applied to the soles of the feet in the low state of acute diseases, for raising the pulse and relieving the head. The chief advantage they have depends on the suddenness of their action.

CHAP. XLI.

LINIMENTS, OINTMENTS, CERATES, and PLASTERS.

THESE are all combinations of fixed oil, or animal fat, with other substances, and differ from each other only in consistence.

Deyeux has, indeed, lately defined plasters to be combinations of oil with metallic oxides; but as this would comprehend many of our present ointments, and exclude many of our plasters, we shall adhere to the old meaning of the terms.

Liniments are the thinnest of these compositions, being only a little thicker than oil.

Ointments have generally a degree of consistence like that of butter.

Cerates are firmer, and contain a larger proportion of wax.

Plasters are the most solid, and when cold should be firm, and should not adhere to the fingers; but when gently heated, should become sufficiently soft to spread easily, and should then adhere to the skin. Plasters derive their firmness, either from a large proportion of wax, rosin, &c. or from the presence of some metallic oxide, such as that of lead.

Plasters should have such a consistence, that when cold they do not adhere to the fingers, but become soft and plastic when gently heated. The heat of the body should render it tenacious enough to adhere to the skin, and to the substance on which it is spread. When prepared, it is usually formed into rolls, and inclosed in paper. Plasters of a small size are often spread on leather, sometimes on strong paper, by means of a spatula gently heated, or the thumb. The leather is cut of the shape wanted, but somewhat larger; and the margin all round, about $\frac{1}{4}$ inch in breadth is left uncovered, for its more easy removal when necessary. Linen is also often used, especially for the less active plasters, which are used as dressings, and often renewed. It is generally cut into long slips of various breadths, from one to six inches. These may either be dipped into the melted plaster, and passed through two pieces of straight and smooth wood, held firmly together, so as to remove any excess of plaster; or, what is more elegant, they are spread on one side only, by stretching the linen, and applying the plaster, which has been melted and allowed to become almost cold, evenly by means of a spatula, gently heated, or, more accurately, by passing the linen on which the plaster has been laid, through a machine formed of a spatula fixed, by screws, at a proper distance from a plate of polished steel.

To prevent repetition, the Edinburgh college give the following canon for the preparation of these substances.

In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding, at the same time, the dry ingredients, if there be any, until the mixture, on cooling, becomes stiff. (*Ed.*)

ADIPIS SUILLÆ, SEVIQUE OVILLI, PRÆPARATIO.

*Lond.**The Preparation of Hog's Lard and Mutton Suet.*

Cut them into pieces, and melt them over a slow fire ; then separate them from the membranes by straining.

BEFORE proceeding to melt these fats, it is better to separate as much of the membranes as possible, and to wash them in repeated quantities of water until they no longer give out any colour. Over the fire they will be perfectly transparent, and if they do not crackle on throwing a few drops into the fire, it is a sign that all the water is evaporated, and that the fats are ready for straining, which should be done through a linen cloth without expression. The residuum may be repeatedly melted with a little water, until it become discoloured with the fire. The fluid fat should be poured into the vessels, or bladders, in which it is to be preserved.

These articles had formerly a place also among the preparations of the Edinburgh college. But now they introduce them only into their list of the materia medica ; as the apothecary will in general find it more for his interest to purchase them thus prepared, than to prepare them for himself ; for the process requires to be very cautiously conducted, to prevent the fat from burning or turning black.

LINIMENTUM SIMPLEX. *Ed.**Simple Liniment.*

Take of

Olive oil, four parts ;

White wax, one part.

THIS consists of the same articles which form the Unguentum simplex of the Edinburgh pharmacopœia, but merely in a different proportion, so as to render the composition thinner ; and where a thin consistence is requisite, this may be considered as a very elegant and useful application.

Off. prep.—Ungt. oxidi zinci impuri, *Ed.* Ungt. oxidi zinci, *Ed.*

UNGUENTUM APIDIS SUILLÆ. *Lond.**Ointment of Hog's Lard.*

Take of

Prepared hog's lard, two pounds ;

Rose water, three ounces.

Beat the lard with the rose water until they be mixed ; then melt the mixture with a slow fire, and set it apart that the water may subside, after which, pour off the lard from the water, constantly stirring it until it be cold.

Off. prep.—Ungt. helleb. albi, *Lond.* Ungt. sulph. *Lond. Dub.*
Ungt. calcis hydrarg. albi, *Lond.* Ungt. rutixæ, *Dub.*

UNGUENTUM SIMPLEX. *Ed.*

Simple Ointment.

Take of

Olive oil, five parts ;

White wax, two parts.

Off. prep.—Ungt. oxidi plumbi albi, *Ed.* Ungt. acet plumbi, *Ed.*

BOTH these ointments may be used for softening the skin and healing chaps. The last is, however, preferable, as being more steadily of one uniform consistence. For the same reason it is also to be preferred as the basis of other more compounded ointments.

UNGUENTUM SPERMATIS CETI. *Lond. Dub.*

Ointment of Spermaceti.

Take of

Spermaceti, six drachms ;

White wax, two drachms ;

Olive oil, three ounces.

Melt them together over a slow fire, stirring them constantly and briskly until they be cold.

THIS had formerly the name of *Linimentum album*, and it is perhaps only in consistence that it can be considered as differing from the unguentum simplex, already mentioned, or the ceratum simplex, afterwards to be taken notice of.

Off. prep.—Ungt. tutixæ, *Lond.*

UNGUENTUM CERÆ. *Lond. Dub.*

Wax Ointment.

Take of

White wax, four ounces ;

Spermaceti, three ounces ;

Olive oil, one pint, (fourteen ounces, *Dub.*)

Stir them, after being melted with a slow fire, constantly and briskly, until cold.

THIS ointment had formerly the title of *Unguentum album* in the London pharmacopœia. It differs very little from the *Unguentum simplex* of the Edinburgh pharmacopœia, and in nothing from the *Unguentum spermatis ceti* of the other pharmacopœias, excepting that in this ointment the proportion of wax is four times greater. It is an useful cooling ointment for excoriations and other frettings of the skin.

Off. prep.—Cerat. carb. zinci impuri, *Ed.*

CERATUM SIMPLEX. *Ed.*

Simple Cerate.

Take of

Olive oil, six parts ;

White wax, three parts ;

Spermaceti, one part.

Off. prep.—Cerat cantharidis, *Lond. Dub.*

CERATUM SPERMATIS CETI. *Lond. Dub.*

Cerate of Spermaceti.

Take of

Spermaceti, half an ounce ;

White wax, two ounces ;

Olive oil, four ounces.

Melt them together, and stir until the cerate be cold.

THIS had formerly the name of *Ceratum album*, and it differs in nothing from the *Unguentum spermatis ceti*, or *Linimentum album*, as it was formerly called, excepting in consistence, both the wax and the spermaceti bearing a greater proportion to the oil.

UNGUENTUM RESINÆ FLAVÆ. *Lond. Dub.*

Ointment of Yellow Resin.

Take of

Yellow resin,

Yellow wax, of each one pound ;

Olive oil, one pint, (seven ounces, *Dub.*)

Melt the resin and wax with a slow fire ; then add the oil and strain the mixture while hot.

UNGUENTUM RESINOSUM. *Ed.*

Resinous Ointment.

Take of

Hog's lard, eight parts ;

White resin, five parts ;
Yellow wax, two parts.

THESE are commonly employed in dressings, for digesting, cleansing, and incarnating, wounds and ulcers.

Off. prep.—Cerat. resin. flav. *Lond. Dub.* Ungt. canth. *Lond. Dub.* Ungt. pulv. mel. vesic, *Ed.* Ungt. sub-acet. cupri, *Ed.*

CERATUM RESINÆ FLAVÆ. *Lond. Dub.*

Cerate of Yellow Resin.

Take of

Ointment of yellow resin, half a pound ;
Yellow wax, one ounce.

Melt them together, and make a cerate.

THIS had formerly the name of *Unguentum citrinum*. It is no otherwise different from the Yellow basilicum, or *Unguentum resinæ flavæ*, than being of a stiffer consistence, which renders it for some purposes more commodious.

EMPLASTRUM CERÆ. *Dub.* EMPLASTRUM CERÆ COMPOSITUM. *Lond.*

Compound Wax Plaster.

Take of

Yellow wax,
Prepared mutton suet, of each three pounds ;
Yellow resin, one pound.

Melt them together, and strain the mixture while it is fluid.

EMPLASTRUM SIMPLEX, OLIM EMPLASTRUM CERÆUM. *Edin.*

Simple or Wax Plaster.

Take of

Yellow wax, three parts ;
Mutton suet,
White resin, each two parts.

THIS is chiefly used to support the discharge from a part which has been blistered, and was therefore formerly called *Emplastrum attrahens*. Sometimes, however, it irritates too much on account of the resin ; and hence, when designed only for dressing blisters, the resin ought to be entirely omitted, unless where a continuance of the pain and irritation, excited by the vesicatory, is required. Indeed, plasters of any kind are not very proper for

dressings blisters; their consistence makes them sit uneasy, and their adhesiveness renders the taking them off painful. Cerates, which are softer and less adhesive, appear much more eligible; the Ceratum spermatis ceti will serve for general use; and for some particular purposes, the Ceratum resinæ flavæ may be applied.

Off. prep.—Empl. canth. *Lond. Dub.*

UNGUENTUM ELEMI. *Dub.* UNGUENTUM ELEMI COMPOSITUM. *Lond.*

Compound Ointment of Elemi.

Take of

Elemi, one pound;
Turpentine, ten ounces;
Mutton suet, prepared, two pounds;
Olive oil, two ounces.

Melt the elemi with the suet; and having removed it from the fire, mix it immediately with the turpentine and oil; after which strain the mixture.

THIS ointment, formerly known by the name of *Linimentum Arcai*, has long been used for digesting, cleansing, and incarnating; and for these purposes is preferred by some surgeons to all the other compositions of this kind, probably because it is more expensive.

UNGUENTUM PICIS. *Lond. Dub.*

Tar Ointment.

Take of

Tar,
Mutton suet, prepared, of each half a pound.

Melt them together, and strain.

Edin.

Take of

Tar, five parts;
Yellow wax, two parts.

THESE compositions cannot be considered as differing essentially from each other. As far as they have any peculiar activity, this entirely depends on the tar. From the empyreumatic oil and saline matters which it contains, it is undoubtedly of some activity. Accordingly, it has been successfully employed against some cutaneous affections, particularly tinea capitis.

EMPLASTRUM PICIS BURGUNDICÆ. *Dub.* **EMPLASTRUM PICIS COMPOSITUM.** *Lond.*
Compound Burgundy Pitch Plaster.

Take of

Burgundy pitch, two pounds ;
Ladanum, (Galbanum, *Dub.*) one pound ;
Yellow resin,
Yellow wax, of each four ounces ;
Expressed oil of mace, one ounce.

To the pitch, resin, and wax, melted together, add first the ladanum, (galbanum, *Dub.*) and then the oil of mace.

EMPLASTRUM CUMINI. *Lond.*
Cummin Plaster.

Take of

Cummin seeds,
Caraway seeds,
Bay berries, of each three ounces ;
Burgundy pitch, three pounds ;
Yellow wax, three ounces.

Melt the pitch and wax together, and mix with them the rest of the ingredients, powdered, and make a plaster.

THIS plaster has been recommended as a moderately warm discutient ; and is directed by some to be applied to the hypogastric region, for strengthening the viscera, and expelling flatulencies.

EMPLASTRUM LADANI COMPOSITUM. *Lond.*
Compound Ladanum Plaster.

Take of

Ladanum, three ounces ;
Frankincense, one ounce ;
Cinnamon, powdered,
Expressed oil of mace, of each half an ounce ;
Essential oil of mint, one drachm.

To the melted frankincense, add first the ladanum, softened by heat ; then the oil of mace. Mix these afterwards with the cinnamon and oil of mint, and beat them together, in a warm mortar, into a plaster. Let it be kept in a close vessel.

THIS has been considered as a very elegant stomach plaster. It is contrived so as to be easily made occasionally, (for these kinds

of compositions, on account of their volatile ingredients, are not fit for keeping), and to be but moderately adhesive, so as not to offend the skin, and that it may, without difficulty, be frequently renewed; which these sorts of applications, in order to their producing any considerable effect, require to be.

UNGUENTUM SAMBUCL. *Lond. UNGUENTUM SAMBUCL-
NUM. Dub.
Elder Ointment.*

Take of

Elder flowers, four pounds;
Mutton suet, prepared, three pounds;
Olive oil, one pint.

Boil the flowers in the suet and oil, till they be almost crisp; then strain with expression.

COMPOSITIONS of this kind were formerly very frequent; but vegetables, by boiling in oils, impart to them nothing but a little mucilage, which changes the greasy oils to drying oils, and any resin they may contain; but that also is never in such quantity as to affect the nature of the oil. We, therefore, do not suppose that this ointment possesses any properties different from a simple ointment of the same consistence.

UNGUENTUM CANTHARIDIS. *Lond. UNGUENTUM
CANTHARIDUM. Dub.
Ointment of Spanish Flies.*

Take of

Spanish flies, powdered, two ounces;
Distilled water, eight ounces, (water, nine ounces, *Dub.*)
Ointment of yellow resin, eight ounces.

Boil the water with the Spanish flies to one half, and strain. To the strained liquor add the ointment of yellow resin. Evaporate this mixture to the thickness of an ointment in a water-bath, saturated with sea-salt.

UNGUENTUM INFUSI MELOES VESICATORII; vulgo
UNGUENTUM EPISPASTICUM MITIUS. *Ed.
Ointment of Infusion of Cantharides, commonly called Mild or
Epispastic Ointment.*

Take of

Cantharides,
White resin,
Yellow wax, each one part;

Hog's lard,
 Venice turpentine, each two parts ;
 Boiling water, four parts.

Macerate the cantharides in the water for a night ; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed ; then add the resin and wax ; and when these are melted, take the ointment off the fire and add the turpentine.

THESE ointments, containing the soluble parts of the cantharides, uniformly blended with the other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in substance. A very good stimulating liniment is composed by melting one part of this with half a part of camphor in powder, and three parts of turpentine.

UNGUENTUM PULVERIS MELOES VESICATORII ;
 olim UNGUENTUM EPISPASTICUM FORTIUS. *Edin.*

Ointment of the Powder of Spanish Flies, formerly Stronger Epispastic Ointment.

Take of
 Resinous ointment, seven parts ;
 Powdered cantharides, one part.

THIS ointment is employed in the dressings for blisters, intended to be made *perpetual*, as they are called, or to be kept running for a considerable time, which, in many chronic, and some acute cases, is of great service. Particular care should be taken, that the cantharides employed in these compositions be reduced into very subtile powder, and that the mixtures be made as equal and uniform as possible.

CERATUM CANTHARIDIS. *Lond. Dub.*
Cerate of Cantharides.

Take of
 Cerate of spermaceti, softened with heat, six drachms, (one ounce, *Dub.*)
 Spanish flies, finely powdered, one drachm, (four scruples, *Dub.*)
 Mix them.

THIS is also an issue ointment, of a considerably firmer consistency than either of the former.

EMPLASTRUM CANTHARIDIS. *Lond. Dub.**Plaster of Spanish Flies.*

Take of

Spanish flies, finely powdered, one pound ;

Wax plaster, two pounds ;

Prepared hog's lard, half a pound.

Having melted the plaster and lard, sprinkle and mix in the flies, a little before they become firm.

EMPLASTRUM MELOES VESICATORII ; olim EMPLASTRUM VESICATORIUM. *Ed.**Plaster of Spanish Flies, formerly Blistering Plaster.*

Take of

Mutton suet,

Yellow wax,

White resin,

Cantharides, each equal weights.

Mix the cantharides, reduced to a fine powder, with the other ingredients, previously melted, and removed from the fire.

IN making these plasters, from an incautious application of heat, the cantharides sometimes lose their vesicating powers ; therefore it is customary, after the blister is spread, to cover its surface with powdered cantharides. The effect is also more speedy and certain, if the part to which it is to be applied be well bathed with hot vinegar ; and it is more easily removed if a bit of thin gauze be interposed between it and the skin.

EMPLASTRUM MELOES VESICATORII COMPOSITUM. *Edin.**Compound Plaster of Spanish Flies.*

Take of

Burgundy pitch,

Venice turpentine,

Cantharides, each twelve parts ;

Yellow wax, four parts ;

Sub-acetite of copper, two parts ;

Mustard seed,

Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these, in fusion, and still hot, add the other ingredients, reduced to a fine powder, and mixed, and stir the whole carefully together, so as to form a plaster.

THIS is supposed to be the most infallible blistering plaster. It certainly contains a sufficient variety of stimulating ingredients.

UNGUENTUM HELLEBORI ALBI. *Lond. Dub.*

Ointment of White Hellebore.

Take of

White hellebore, one ounce ;

Ointment of hog's lard, (hog's lard, *Dub.*) four ounces ;

Essence of lemon, half a scruple.

Mix, and make them into an ointment.

THIS is recommended in the itch, and other cutaneous affections.

UNGUENTUM SULPHURIS. *Lond. Dub.*

Sulphur Ointment.

Take of

Ointment of hog's lard, half a pound, (five ounces, *Dub.*)

Flowers of sulphur, four (three, *Dub.*) ounces.

Mix them, and make an ointment.

Edin.

Take of

Hog's lard, four parts ;

Sublimed sulphur, one part.

To each pound of this ointment add,

Volatile oil of lemons, or

———— of lavender, half a drachm.

SULPHUR is a certain remedy for the itch, more safe than mercury. A pound of ointment serves for four unctions. The patient is to be rubbed every night, a fourth part of the body at each time. Though the disease may be thus cured by a single application, it is in general advisable to touch the parts most affected for a few nights longer, and to conjoin with the frictions the internal use of sulphur.

UNGUENTUM ACIDI NITROSI. *Ed.*

Ointment of Nitrous Acid.

Take of

Hog's lard, one pound ;

Nitrous acid, six drachms.

Mix the acid gradually with the melted axunge, and diligently beat the mixture as it cools.

THE axunge in this ointment seems to be oxidized; for during the action of the acid upon it, there is a great deal of nitric oxide gas disengaged. It acquires a yellowish colour, and a firm consistency; and forms an excellent and cheap substitute, in slight herpetic and other cutaneous affections, for the ointment of nitrate of mercury.

EMPLASTRUM OXIDI PLUMBI SEMIVITREI; olim EM-
PLASTRUM COMMUNE. *Ed.*

Plaster of the Semi-vitrified Oxide of Lead, formerly Common Plaster.

Take of

Semi-vitrified oxide of lead, one part;

Olive oil, two parts.

Boil them, adding water, and constantly stirring the mixture till the oil and litharge be formed into a plaster.

EMPLASTRUM LITHARGYRI. *Lond. Dub.,*
Litharge Plaster.

Take of

Litharge, in very fine powder, five pounds;

Olive oil, a gallon, (nine pounds, *Dub.*)

Water, two pints, (two pounds, *Dub.*)

Boil them with a slow fire, constantly stirring until the oil and litharge unite, so as to form a plaster. (But it will be proper to add more boiling water, if the water that was first added be nearly consumed before the end of the process. *Lond.*)

OXIDES of lead, boiled with oils, unite with them into a plaster of an excellent consistence, and forming a proper basis for several other plasters.

In the boiling of these compositions, a quantity of water must be added, to prevent the plaster from burning and growing black. Such water as it may be necessary to add during the boiling, must be previously made hot; for cold liquor would not only prolong the process, but likewise occasion the matter to explode, and be thrown about with violence, to the great danger of the operator: this accident will equally happen upon the addition of hot water, if the plaster be extremely hot. It is therefore better to remove it from the fire a little before each addition of water.

These plasters, which have been long known under the name of Diachylon, are common applications in excoriations of the skin, light flesh wounds, and the like. They keep the part soft and somewhat warm, and defend it from the air; which is all that can be expected in these cases from any plaster.

Off. prep.—Emp. oxidi ferri rubri, *Ed.* Emplast. hydrarg. *Ed.* Emp. thuris comp. *Ed.* Emplast. sap. *Ed.* Lond. *Dub.* Emplast. lith. comp. *Lond.* Emp. gum. *Ed.* Emp. assæ foetid. *Ed.* Emp. lith. cum resina, *Lond.* Emplast. resin. *Ed.* Empl. lith. cum hydrarg. *Lond.*

EMPLASTRUM RESINOSUM; vulgo EEMPLASTRUM ADHÆSIVUM. *Ed.*

Resinous Plaster, commonly called Adhesive Plaster.

Take of

Plaster of semi-vitrified oxide of lead, five parts;

White resin, one part.

EMPLASTRUM LITHARGYRI CUM RESINA. *Lond.*

Litharge Plaster with Resin.

Take of

Litharge plaster, three pounds;

Yellow resin, half a pound.

To the litharge plaster, melted with a very slow fire, add the powdered resin; mix them well, and make a plaster.

THESE plasters are used as adhesives for keeping on other dressings; for retaining the edges of recent wounds together, when we are endeavouring to cure them by the first intention, and especially for giving mechanical support to new flesh; and contracting the size of ulcers, in the manner recommended by Mr. Baynton, for the cure of ulcers of the legs, a mode of treatment so efficacious, that it has entirely changed the character of these sores.

EMPLASTRUM ASSÆ FOETIDÆ. *Ed.*

Plaster of Assa Foetida.

Take of

Plaster of semi-vitrified oxide of lead,

Assa foetida, each two parts;

Galbanum,

Yellow wax, each one part.

THIS plaster is applied to the umbilical region, or over the whole abdomen, in hysteric cases; and sometimes with good effect.

EMPLASTRUM GUMMOSUM. *Edin.*

Gum Plaster.

Take of

Plaster of semi-vitrified oxide of lead, eight parts;
Gum ammoniacum,
Galbanum,
Yellow wax, each one part.

Off. prep.—Emplast. sapon. *Ed.*

EMPLASTRUM LITHARGYRI COMPOSITUM. *Lond.*

Compound Plaster of Litharge.

Take of

Litharge plaster, three pounds;
Strained galbanum, eight ounces;
Turpentine, ten drachms;
Frankincense, three ounces.

The galbanum and turpentine being melted, mix with them the powdered frankincense, and afterwards the litharge plaster, melted also with very slow fire, and make a plaster.

BOTH these plasters are used as digestives and suppuratives; particularly in abscesses, after a part of the matter has been matured and discharged, for suppurating or discussing the induration which remains.

CERATUM SAPONIS. *Lond. Dub.*

Soap Cerate.

Take of

Soap, (hard Spanish soap, *Dub.*) eight ounces;
Yellow wax, ten ounces;
Litharge, powdered, one pound;
Olive oil, one pint, (fourteen ounces, *Dub.*)
Vinegar, one gallon, (eight pounds, *Dub.*)

Boil the vinegar with the litharge, over a slow fire, constantly stirring, until the mixture unites and thickens; then mix in the other articles, and make a cerate.

THIS acts in reality as a saturnine application, the soap having only the effect of giving a very convenient degree of adhesiveness.

EMPLASTRUM SAPONIS. *Lond.* EMPLASTRUM SAPONACEUM. *Dub.*
Soap Plaster.

Take of

Soap, one part;

Litharge plaster, six parts.

Mix the soap with the melted litharge plaster, and boil them to the thickness of a plaster.

EMPLASTRUM SAPONACEUM. *Ed.*
Saponaceous Plaster.

Take of

Plaster of semi-vitrified oxide of lead, four parts;

Gum plaster, two parts;

Soap sliced, one part.

To the plasters, melted together, add the soap; then boil for a little, so as to form a plaster.

THESE are supposed to be mild discutients.

EMPLASTRUM THURIS COMPOSITUM. *Lond.*
Compound Frankincense Plaster.

Take of

Frankincense, half a pound;

Dragons blood, three ounces;

Litharge plaster, two pounds.

To the melted litharge plaster add the resins in powder.

IT has been erroneously supposed that plasters composed of styptic medicines strengthen the part to which they are applied; for plasters in general relax, rather than astringe; and indeed the present example of these supposed astringent plasters is merely a resinous plaster made with expensive ingredients.

UNGUENTUM OXIDI PLUMBI ALBI; vulgo UNGUENTUM ALBUM. *Ed.*

Ointment of White Oxide of Lead, formerly White Ointment.

Take of

Simple ointment, five parts;

White oxide of lead, one part.

THIS is a cooling desiccative ointment, of great use when applied to excoriated surfaces.

UNGUENTUM ACETITIS PLUMBI; vulgo UNGUENTUM SATURNINUM. *Ed.*

Ointment of Acetite of Lead, formerly Saturnine Ointment.

Take of

Simple ointment, twenty parts;

Acetite of lead, one part.

UNGUENTUM CERUSSÆ ACETATÆ. *Lond. Dub.*

Ointment of Acetated Ceruse.

Take of

Acetated ceruse, two drachms;

White wax, two ounces;

Olive oil, half a pint, (half a pound, *Dub.*)

Rub the acetated ceruse, previously powdered, with some part of the olive oil; then add it to the wax, melted with the remaining oil. Stir the mixture until it be cold.

THESE are also excellent cooling ointments, of the greatest use in many cases.

CERATUM LITHARGYRI ACETATI COMPOSITUM.

Lond. CERATUM LITHARGYRI ACETATI. Dub.

Compound Cerate of Acetated Litharge.

Take of

Water of acetated litharge, two ounces and a half;

Yellow wax, four ounces;

Olive oil, nine ounces;

Camphor, half a drachm.

Rub the camphor with a little of the oil, melt the wax with the remaining oil; and as soon as the mixture begins to thicken, pour in by degrees the water of acetated litharge, and stir constantly until it be cold; then mix in the camphor previously rubbed with oil.

THIS composition was much recommended by M. Goulard. It differs from the other saturnine ointments only in consistence.

UNGUENTUM HYDRARGYRI; vulgo UNGUENTUM
COERULEUM. *Ed.*

Ointment of Quicksilver, commonly called Blue Ointment.

Take of

Quicksilver,
Mutton suet, each one part;
Hog's lard, three parts.

Rub the mercury carefully in a mortar with a little of the hog's lard till the globules entirely disappear, then add the rest of the fats.

This ointment may also be made with double or treble the quantity of quicksilver.

UNGUENTUM HYDRARGYRI FORTIUS. *Lond. Dub.*
Stronger Mercurial Ointment.

Take of

Purified quicksilver, two pounds;
Prepared hog's lard, twenty-three ounces;
Prepared mutton suet, one ounce;

First triturate the quicksilver with the suet and a little of the hog's lard until the globules be extinguished; then add the rest of the lard, and form it into an ointment.

UNGUENTUM HYDRARGYRI MITIUS. *Lond. Dub.*
Milder Mercurial Ointment.

Take of

The stronger ointment of quicksilver, one part;
Hog's lard, prepared, two parts.

Mix them.

UNGUENTUM OXIDI HYDRARGYRI CINEREI. *Ed.*
Ointment of Grey Oxide of Quicksilver.

Take of

Grey oxide of quicksilver, one part;
Hog's lard, three parts.

THESE ointments are principally employed, not with a view to their topical action, but with the intention of introducing mercury in an active state into the circulating system; which may be effected by gentle friction on the sound skin of any part, particularly on the inside of the thighs or legs. For this purpose, these simple ointments are much better suited than the more compounded ones with turpentine and the like, formerly employed; for by any acrid substance topical inflammation is apt to be ex-

cited, preventing further friction, and giving much uneasiness. To avoid this, it is necessary, even with the mildest and weakest ointment, to change occasionally the place at which the friction is performed.

It is requisite that the ointments in which the mercury is extinguished by trituration should be prepared with very great care; for upon the degree of triture which has been employed, the activity of the mercury very much depends. The addition of the mutton suet, now adopted by both colleges, is an advantage to the ointment, as it prevents it from running into the state of oil, which the hog's lard alone, in warm weather, or in a warm chamber, it is sometimes apt to do, and which is followed by a separation of parts. We are even inclined to think, that the proportion of suet directed by the London college is too small for this purpose, and indeed seems to be principally intended for the more effectual triture of the mercury; but it is much more to be regretted, that in a medicine of such activity, the colleges should not have directed the same proportion of mercury to the fatty matter.

If the efficacy of the ointment prepared with the grey oxide were sufficiently established, the facility and certainty of its preparation would be attended with great advantages.

EMPLASTRUM HYDRARGYRI. *Ed.*

Plaster of Quicksilver.

Take of

Olive oil,

White resin, each one part;

Quicksilver, three parts;

Plaster of semi-vitrified oxide of lead, six parts.

Melt the oil and resin together, and when this mixture is cold, let the quicksilver be rubbed with it till the globules disappear; then add by degrees the litharge plaster, melted, and let the whole be accurately mixed.

EMPLASTRUM AMMONIACI CUM HYDRARGYRO.

Lond.

Plaster of Gum Ammoniac with Quicksilver.

Take of

Gum ammoniac, strained, one pound;

Purified quicksilver, three ounces;

Sulphuretted oil, a drachm, or as much as may be necessary.

Triturate the quicksilver with the sulphuretted oil, until its globules disappear; then gradually add the gum ammoniac melted, and mix them.

EMPLASTRUM LITHARGYRI CUM HYDRARGYRO.

*Lond.**Litharge Plaster with Quicksilver.*

Take of

Litharge plaster, one pound ;

Purified quicksilver, three ounces ;

Sulphuretted oil, one drachm, or what is sufficient.

Make the plaster in the same manner as the ammoniacum plaster with quicksilver.

THESE mercurial plasters are considered as powerful resolvants and discutients, acting with much greater certainty for these intentions than any composition of vegetable substances alone; the mercury exerting itself in a considerable degree, and being sometimes introduced into the habit in such quantity as to affect the mouth. Pains in the joints and limbs from a venereal cause, nodes, tophi, and beginning indurations, are said to yield to them sometimes.

UNGUENTUM CALCIS HYDRARGYRI ALBI. *Lond.**Ointment of the White Calx of Quicksilver.*

Take of

The white calx of quicksilver, one drachm ;

Ointment of hog's lard, one ounce and a half ;

Mix, and make an ointment.

THIS is very elegant mercurial ointment, and frequently made use of in the cure of obstinate cutaneous affections.

UNGUENTUM OXIDI HYDRARGYRI RUBRI. *Ed.**Ointment of Red Oxide of Quicksilver.*

Take of

Red oxide of quicksilver by nitrous acid, one part ;

Hog's lard, eight parts.

THE oxide should be reduced to very fine powder before it be added to the axunge. This is an excellent stimulating ointment, often of very great service in indolent ill-conditioned sores, when we wish to excite them to greater action. As an eye ointment its effects are most remarkable, in the cure of all inflammations of the tunica conjunctiva, and more particularly when there is a thickening and swelling of the inner membrane of the palpebræ. In such cases it seems to act with much greater certainty, if applied immediately after the eye-lids have been scarified. In inflammation, accompanied with specks, it has a most powerful effect in removing both. It is also useful in all those ophthalmias

which so frequently appear after small-pox, measles, and eruptive diseases of the hairy scalp. It is used in the same quantity, and in the same manner, as the ungt. nitratis hydrargyri; and if it prove too stimulating, it may be diluted with axunge.

UNGUENTUM NITRATIS HYDRARGYRI; vulgo **UNGUENTUM CITRINUM.** *Ed.* **UNGUENTUM HYDRARGYRI NITRATI.** *Lond. Dub.*

Ointment of Nitrate of Quicksilver, commonly called Yellow Ointment. Ointment of Nitrated Quicksilver.

Take of

Quicksilver, one part;

Nitrous acid, two parts;

Olive oil, nine parts; *Ed.*

Hog's lard, three parts, *Ed.* (twelve parts, *Lond. Dub.*)

In a glass mortar beat up the solution with the lard and oil when getting stiff, after having been melted together, until an ointment be formed.

UNGUENTUM NITRATIS HYDRARGYRI MITIUS. *Ed.*

Milder Ointment of Nitrate of Quicksilver.

This is prepared in the same way, with three times the quantity of oil and hog's lard.

THIS ointment was formerly prepared with lard alone; but it soon became so very hard, that it was necessary to melt it with fresh axunge before it could be used. The substitution in the present formula, of the oil for part of the axunge, obviates in a great measure this inconvenience. The hardening is entirely owing to the excess of the acid in the solution of mercury. But the property which nitrate of mercury, prepared by ebullition, has, of being decomposed by water, furnished me with an easy way of getting rid of all excess of acid, and of procuring the sub-nitrate of mercury in the state of the most minute division possible. An ointment prepared with this sub-nitrate had a most beautiful golden colour; after six months was perfectly soft, and succeeded in curing a very bad case of herpes.

Med. use.—This ointment has the very best effects in herpes, tinea capitis, and similar obstinate cutaneous affections, and is almost specific in psorophthalmia, in those slight excoriations of the tarsi, attended with extreme itching, and in all the inflammations of the eyes, attended by eruptive disorders of the hairy scalp or face. It is most conveniently and effectually used, by rubbing a piece of the size of half a garden pea, with the point

of a hair pencil, over the tarſi, among the roots of the ciliæ, and allowing a ſmall quantity to get on the inner membrane of the palpebræ. In obſtinate caſes, a weak ſolution of muriate of mercury, uſed as a collyrium along with this ointment, proves a moſt powerful remedy.

UNGUENTUM SUB-ACETITIS CUPRI. *Edin.*

Ointment of Sub-Acetite of Copper.

Take of

Reſinous ointment, fifteen parts;

Sub-acetite of copper, one part.

THIS ointment is uſed for cleaning ſores, and keeping down fungous fleſh. Where ulcers continue to run from a weakneſs in the veſſels of the parts, the tonic powers of copper promiſe conſiderable advantage.

It is alſo frequently uſed with advantage in caſes of ophthalmia, depending on ſcrofula, where the palpebræ are principally affected; but when it is to be thus applied, it is in general requiſite that it ſhould be ſomewhat weakened by the addition of a proportion of ſimple ointment or hog's lard.

UNGUENTUM OXIDI ZINCI IMPURI; olim UNGUENTUM TUTIÆ. *Edin.*

Ointment of Impure Oxide of Zinc, formerly Ointment of Tutty.

Take of

Simple liniment, five parts;

Prepared impure oxide of zinc, one part.

UNGUENTUM TUTIÆ. *Lond. Dub.*

Ointment of Tutty.

Take of

Prepared tutty,

Ointment of ſpermaceti, (hog's lard, *Dub.*) as much as may be ſufficient.

Mix them ſo as to make a ſoft ointment.

UNGUENTUM OXIDI ZINCI. *Ed.*

Ointment of Oxide of Zinc.

Take of

Simple liniment, ſix parts;

Oxide of zinc, one part.

THESE ointments are chiefly uſed in affections of the eye, particularly in thoſe caſes where redneſs ariſes rather from relaxation than from active inflammation.

CERATUM CARBONATIS ZINCI IMPURI; olim CERATUM LAPIDIS CALAMINARIS. *Ed.*

Cerate of Impure Carbonate of Zinc, formerly Cerate of Calamine.

Take of

Simple cerate, five parts;

Prepared impure carbonate of zinc, one part.

CERATUM LAPIDIS CALAMINARIS; olim CERATUM EPULOTICUM. *Lond. Dub.*

Calamine Cerate, formerly Epulotic Cerate.

Take of

Calamine, prepared,

Yellow wax, of each half a pound, (one part, *Dub.*)

Olive oil, one pint, (two parts, *Dub.*)

Melt the wax with the oil; and as soon as the mixture, exposed to the air, begins to thicken, mix with it the calamine, and stir the cerate until it be cold.

THESE compositions resemble the cerate which Turner strongly recommends in cutaneous ulcerations and excoriations, and which has been usually distinguished by his name. They appear, from experience, to be excellent epulotics, and as such, are frequently made use of in practice.

EMPLASTRUM OXIDI FERRI RUBRI; olim EMPLASTRUM ROBORANS. *Ed.*

Plaster of Red Oxide of Iron, commonly called Strengthening Plaster.

Take of

Plaster of semi-vitrified oxide of lead, twenty-four parts;

White resin, six parts;

Yellow wax,

Olive oil, each three parts;

Red oxide of iron, eight parts.

Grind the red oxide of iron with the oil, and then add it to the other ingredients previously melted.

THIS plaster is used in weaknesses of the large muscles, as of the loins: and its effects seem to proceed from the mechanical support given to the part, which may also be done by any other plaster that adheres with equal firmness.

T A B L E S,

Shewing the Proportion of ANTIMONY, OPIUM, and QUICKSILVER, contained in some Compound Medicines.

TARTRITE OF ANTIMONY.

Wine of Tartrite of Antimony contains two grains of tartrite of antimony, or tartar-emetic, in the ounce. *Ed.*

OPIUM.

Opiate Confection contains one grain of opium in thirty-six grains. *Lond.*

Opiate or Thebaic Electuary, contains in each drachm about a grain and a half of opium. *Edin.*

Electuary of Catechu, or Japonic Confection, contains in each ounce about two grains and a half of opium; for one grain of opium is contained in one hundred and ninety-three grains. *Ed.*

Compound Powder of Chalk with Opium contains one grain of opium in about forty-three grains. *Lond.*

Compound Powder of Ipecacuan contains one grain of opium in ten grains. *Lond.*

Powder of Ipecacuan and Opium contains six grains of opium in each drachm, or one grain in ten. *Ed.*

Opiate Powder contains one grain of opium in ten. *Lond.*

Pills of Opium contain one grain of opium in five. *Lond.*

Opiate or Thebaic Pills contain six grains of opium in each drachm, or five grains contains half a grain of opium. *Ed.*

Tincture of Opium or *Liquid Laudanum* is made with two scruples of opium in each ounce of the liquid, or with five grains in each drachm. But a drachm of the tincture appears, by evaporation, to contain about three grains and a half of opium. *Ed.*

Ammoniated Tincture of Opium, or Paregoric Elixir, is made with about eight grains in each ounce of the liquid, or with about one grain in the drachm. *Ed.*

Tincture of Soap and Opium, formerly called *Opiate Liniment, Anodyne Balm*, is made with one scruple of opium in each ounce of the liquid. *Ed.*

Troches of Liquorice with Opium, contain about one grain of opium in each drachm. *Ed.*

QUICKSILVER.

Quicksilver Pills contain five grains of quicksilver in each drachm. Each pill contains one grain of quicksilver. *Ed.*

Quicksilver Pills contain four grains of quicksilver in twelve grains. *Lond.*

Quicksilver Ointment contains twelve grains of quicksilver in each drachm; made with double quicksilver, each drachm contains twenty-four grains. *Ed.*

Stronger Quicksilver Ointment contains one drachm of quicksilver in two drachms. *Lond.*

Weaker Quicksilver Ointment contains one drachm of quicksilver in six drachms.

Quicksilver Plaster contains about sixteen grains of quicksilver in each drachm. *Ed.*

Plaster of Litharge with Quicksilver contains about one ounce of quicksilver in five ounces. *Lond.*

Plaster of Ammoniac with Quicksilver contains about one ounce of quicksilver in five ounces. *Lond.*

owder of Scammony with Calomel contains one grain of calomel in four grains. *Lond.*

Ointment of Nitrated Quicksilver contains twelve grains of nitrated quicksilver in one drachm. *Lond.*

Stronger Ointment of Nitrate of Quicksilver contains in each drachm four grains of quicksilver and eight of nitrous acid. *Ed.*

Milder Ointment of Nitrate of Quicksilver contains in each scruple half a grain of quicksilver, and one grain of nitrous acid. *Ed.*

Ointment of White Calx of Quicksilver contains in each drachm about four grains and a half of the calx. *Lond.*

OR,

One grain of <i>Tartrite of Antimony</i> is contained in		
Wine of tartrite of antimony. <i>Ed.</i>	grs.	240
Wine of antimoniated tartar. <i>Dub.</i>		120
Wine of tartarised antimony. <i>Lond.</i>		120
Wine of antimony. <i>Lond.</i>		uncertain.

One grain of precipitated *Sulphuret of Antimony* is contained in
Compound pills of antimony. *Dub.*

One grain of <i>Opium</i> is contained in		
Opiate confection. <i>Lond.</i>	grs.	36
Opiate electuary. <i>Ed.</i>		43
Electuary of catechu. <i>Ed.</i>		193

One grain of *Opium* is contained in

Compound electuary of catechu.	<i>Dub.</i>	grs. 199
Troches of liquorice with opium.	<i>Ed.</i>	75
Compound troches of liquorice.	<i>Dub.</i>	60
Pills of opium.	<i>Lond.</i>	5
Opiate pills.	<i>Ed.</i>	10
Opiate powder.	<i>Lond.</i>	10
Compound powder of chalk with opium.	<i>Lond.</i>	43
Compound powder of ipecacuan.	<i>Lond. Dub.</i>	10
Powder of ipecacuan and opium.	<i>Ed.</i>	10
Tincture of opium.	<i>Ed. Lond. Dub.</i>	12
Camphorated tincture of opium.	<i>Lond.</i>	244
Ditto ditto	<i>Dub.</i>	196
Ammoniated tincture of opium.	<i>Ed.</i>	68
Tincture of soap and opium.	<i>Ed.</i>	31.5

One grain of *Quicksilver* is contained in

Quicksilver pills.	<i>Lond.</i>	grs. 3.
Ditto	<i>Dub.</i>	2.5
Ditto	<i>Edin.</i>	4
Stronger quicksilver ointment.	<i>Lond. Dub.</i>	2
Weaker quicksilver ointment.	<i>Lond. Dub.</i>	6
Quicksilver ointment.	<i>Edin.</i>	5
Quicksilver plaster.	<i>Ed.</i>	5.5
Litharge plaster with quicksilver.	<i>Lond.</i>	5.
Ammoniac plaster with quicksilver.	<i>Lond.</i>	5.

One grain of *Calomel* is contained in

Powder of scammony with calomel.	<i>Lond.</i>	grs. 4
Compound antimonial pills.	<i>Dub.</i>	2.7

One grain of the *Grey Oxide of Quicksilver* is contained in

Ointment of the grey oxide of quicksilver.	<i>Ed.</i>	grs. 4
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One grain of the *Red Oxide of Quicksilver* is contained in

Ointment of red oxide of quicksilver.	<i>Ed.</i>	grs. 9
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One grain of *Submuriate of Quicksilver and Ammonia* is contained in

Ointment of white calx of quicksilver.	<i>Lond.</i>	grs. 13
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One grain of *Nitrate of Mercury* is contained in

Stronger ointment of nitrate of mercury.	<i>Ed.</i>	grs. 5
Ointment of nitrated quicksilver.	<i>Lond. Dub.</i>	5
Milder ointment of nitrate of quicksilver.	<i>Ed.</i>	13

In many instances these proportions are only to be considered as approximations to the truth, as they are calculated from the

quantities of the ingredients taken to form the preparation, not from the quantities which exist in it after it is formed. The *nitrate of mercury*, for example, in the different ointments into which it enters, is estimated as equal to the whole quantity of mercury and nitrous acid employed to form it, although, from the very nature of the preparation, it cannot be so much. In the solutions of opium, the opium is estimated as equal to the whole quantity employed, although not above two thirds of it be dissolved. Lastly, no allowance is made for the loss by evaporation; and hence, notwithstanding the difference by calculation, the *Edinburgh troches of liquorice with opium* contain probably as much opium as those of Dublin; for the former, being made with syrup, will lose more in drying than the latter, which are made with extract of liquorice.

POSOLOGICAL and PROSODIAL TABLE.

A CETIS potassæ, \mathfrak{D} i to \mathfrak{z} i.

Acetitis ammoniæ aqua, \mathfrak{z} ij to \mathfrak{z} vi.

Acidum acetosum impurum, \mathfrak{z} i to \mathfrak{z} fs; \mathfrak{z} i to \mathfrak{z} ij, in glysters.
destillatum, do.

aromaticum *analeptic.*

forte, \mathfrak{D} i to \mathfrak{z} i.

camphoratum *analeptic.*

Acidi acetosi syrupus, \mathfrak{z} i to \mathfrak{z} ij.

carbōnici aqua, $\mathfrak{t}\mathfrak{b}$ ij *daily.*

Acidum benzoicum, \mathfrak{g}^r x to \mathfrak{z} fs.

muriaticum, \mathfrak{g}^r x to \mathfrak{g}^t xl.

nitrosus, \mathfrak{g}^t v to \mathfrak{g}^t xx.

dilutum, \mathfrak{g}^t x to xl.

succinicum, \mathfrak{g}^r v to \mathfrak{D} i.

sulphuricum dilutum, \mathfrak{g}^t xv to \mathfrak{g}^t xxx.

aromaticum, \mathfrak{g}^t xv to xxx.

Aconiti napelli herba, \mathfrak{g}^r i to \mathfrak{g}^t v.

succus spissatus, \mathfrak{g}^r $\frac{1}{2}$ to \mathfrak{g}^r iij.

Acōri cālami radix, \mathfrak{D} i to \mathfrak{z} i.

Aesculi hippocastani cortex, \mathfrak{z} fs to \mathfrak{z} i.

Aether sulphuricus, \mathfrak{g}^t xx to \mathfrak{z} i.

cum alcoholē, \mathfrak{z} fs to \mathfrak{z} ij.

cum alcoholē aromaticus, \mathfrak{z} fs to \mathfrak{z} ij.

Alcohol, \mathfrak{z} fs to \mathfrak{z} i.

ammoniātum, \mathfrak{z} fs to \mathfrak{z} i.

aromaticum, \mathfrak{z} fs to \mathfrak{z} i.

foetidum, \mathfrak{z} fs to \mathfrak{z} i.

succinātum, \mathfrak{g}^t x to xl.

Allii sativi radix, 3*li* to 3*ij*.

Alōēs perfoliatæ focotorinæ succus spissatus, g^r v to xv.
 pulvis cum canella, g^r x to 3*i*.
 pulvis cum ferro, g^r v to 3*i*.
 pulvis cum guaiaco, g^r x to 3*i*.
 pilulæ, g^r xv to 3*ss*.
 pilulæ compositæ, g^r x to xxv.
 pilulæ cum assa foetida, g^r x to 3*i*.
 cum colocynthide, g^r v to g^r x.
 cum myrrha, g^r x to 3*i*.
 tinctura, 3*ss* to 3*ij*.
 tinctura cum myrrha, 3*ss* to 3*ij*.
 tinctura ætherææ, 3*ss* to 3*ij*.
 vinum, 3*ss* to 3*iss*.
 extractum, g^r v to xv.

Althææ officinalis decoctum, ad libitum.
 syrūpus, 3*i* to 3*ij*.

Alūmīnæ sulphas, 3*ss* to 3*i*.
 sulphātis pulvis compositus, g^r x to 3*ss*.

Ammōniæ aqua, g^t x to xv.
 acetitis aqua, 3*ss*.
 hydro-sulphuretum, g^t v to xij.
 carbōnas, g^r v to g^r xv.
 carbōnātis aqua, g^t xx to 3*i*.

Ammōniacum gummi resina, g^r x to 3*ss*.

Ammōniaci lac, 3*ij* to 3*i*.

Amōmi zingibēris radix, g^t v to 3*i*.
 syrūpus, 3*i* to 3*ij*.
 tinctura, 3*i* to 3*ij*.
 repentis semina, g^r v to 3*i*.
 tinctura, 3*i* to 3*ij*.
 tinctura composita, 3*i* to 3*ij*.
 zedoariæ radix, 3*i* to 3*i*.

Amygdali communis oleum fixum, 3*ij* to 3*i*.
 emulsio, 3*ij* daily.

Amȳli mucilāgo, 3*iv* to 3*vj* in glyster.
 trochisci, 3*i* to 3*ij*.

Amȳridis elēmiferæ resina, g^r x to 3*ss*.
 gileadensis resina liquida, 3*i* to 3*i*.

Anēthi grāvēolentis semina, 3*i* to 3*i*.
 aqua destillata, 3*i* to 3*ij*.

foenicūli semina, 3*i* to 3*i*.
 aqua destillata, 3*i* to 3*ij*.
 oleum volatile, g^{tt} ij to g^t v.

Angēlicæ archangēlicæ radix, herba, semen, 3*ss* to 3*ss*.

Angustūræ cortex, g^r x to 3*i*.

- Anthemidis nobilis flores**, \mathfrak{D} i to \mathfrak{z} i.
 decoctum, *in glyster*.
 extractum, gr^{r} x to \mathfrak{z} i.
pyrēthri radix, gr^{r} iij to \mathfrak{D} i.
- Antimonii sulphurētum pręparātum**, gr^{r} xv to \mathfrak{D} ij.
 oxidum cum sulphūre per nitrātem potassę, gr^{r} i to iv.
 cum sulphūre vitrificātum, gr^{r} $\frac{1}{4}$ to ifs.
 vitrificātum cum cęra, gr^{r} iij to \mathfrak{D} i.
 sulphurētum fuscum (*kermēs mineralis*) gr^{r} i to ifs.
 pręcipitātum, gr^{r} i to iv.
 oxidum cum phosphāte calcis, gr^{r} iij to viij.
 et potassę tartris, gr^{r} i to i.
 tartritis vinum, \mathfrak{z} ij to vi.
 vinum, \mathfrak{z} iij to \mathfrak{z} fs.
 oxidum album (*antimonium calcinatum*) gr^{r} x to \mathfrak{z} fs.
 pilulę compositę, gr^{r} iij to v.
- Apri petrōselini semina**, \mathfrak{D} i to ij.
Arbuti uvę ursi folia, gr^{r} x to \mathfrak{D} ij.
Arctii lappę radix, *a decoction of* \mathfrak{z} ij *in lb ij of water, daily*.
Argenti nitras, gr^{r} $\frac{1}{8}$ to $\frac{1}{2}$.
Arimaculati radix, gr^{r} vi to \mathfrak{D} i.
 conserva, \mathfrak{z} fs to \mathfrak{z} ifs.
- Aristolōchię serpentarię radix**, \mathfrak{D} i to \mathfrak{z} i.
 tinctura, \mathfrak{z} i to \mathfrak{z} iij.
- Arnicę montanę herba**, gr^{r} v to x.
Arsenici oxidum album, gr^{r} $\frac{1}{8}$.
Artēmisie abrotani folia, \mathfrak{D} i to \mathfrak{z} i.
 maritimę cacūmina, \mathfrak{D} i to \mathfrak{z} i.
 conserva, \mathfrak{z} ij to \mathfrak{z} fs.
 fantonicę cacūmina, \mathfrak{z} fs to \mathfrak{z} i.
 absinthii herba, \mathfrak{D} i to \mathfrak{D} ij.
- Asari europęę folia**, gr^{r} ij to iv.
 pulvis compositus, gr^{r} v to \mathfrak{D} i.
- Astragali tragacanthę pulvis compositus**, \mathfrak{z} fs to \mathfrak{z} ifs.
- Atrōpę belladonnę folia**, gr^{r} fs to gr^{r} v.
 succus spissatus, gr^{r} $\frac{1}{4}$ to gr^{r} iij.
- Barytę muriatis solutio**, gr^{r} v to x.
Bitūmen petrolęum sulphurātum, gr^{r} v to xxx.
Bitūminis petrolęi olęum, gr^{r} x to xxx.
- Bolus gallicus**, \mathfrak{D} i to \mathfrak{z} i.
Bubōnis galbani gummi resina, gr^{r} x to \mathfrak{D} i.
 pilulę compositę, gr^{r} x to \mathfrak{z} fs.
 tinctura, \mathfrak{z} i to iij.
- Calcis aqua**, \mathfrak{z} iv to lb i *daily*.

- Calcis muriātis solūtio, g^r xl to 3 i.
 carbōnas præparātus, ʒ i to 3 i.
 carbōnātis mistūra, 3 i to ij.
 pulvis compositus, ʒ i to ij.
 carbōnātis pulvis compositus cum opio, g^r xv to ʒ ij.
 trochisci, 3 i to ij.
 Cancrī astāci lapilli præparāti, 3 t to i.
 pāgūri chēlæ præparātæ, 3 ss to i.
 chelarum pulvis compositus, ʒ i to ij.
 Canellæ albæ cortex, g^r xv to ʒ ij.
 Capsici annui fructus, g^r v to x.
 Cardamīnes prātenſis flores, 3 ss to 3 i.
 Cari carūi semīna, g^r x to 3 i.
 oleum volatile, g^r i to v.
 spiritus, 3 ij to 3 i.
 Caryophylli arōmatici floris germen, g^r v to ʒ i.
 oleum volatile, g^r ij to v.
 Cassiæ fistulæ pulpa, 3 ss to i.
 electuārium, 3 ij to 3 i.
 Cassiæ fennæ folia, ʒ i to 3 i.
 pulvis compositus, ʒ i to 3 i.
 infūsum, 3 i to iij.
 infūsum tartarisātum, 3 iss to iij.
 tinctura, 3 ss to 3 i.
 electuārium, 3 i to 3 ss.
 extractum, g^r x to 3 ss.
 Castōrēum rossicum, g^r x to ʒ i.
 Castorei tinctūra, 3 i to ij.
 composita, 3 ss to i.
 Centaureæ benēdictæ herba, g^r xv to 3 i.
 Cephaëlīdis ipecacūanhæ radix, ʒ i to 3 ss.
 vinum, 3 ss to 3 i.
 pulvis compositus, ʒ ss to ʒ i.
 Cēra, ʒ i to 3 i, *in emulsion*.
 Cervi elāphi cornu decoctum, 3 ij to iv.
 ustum, 3 ss to 3 i ss.
 Chironiæ centaurēi summitates, ʒ i to 3 i.
 Cināræ scōlymi folia, 3 ss to i, *of the expressed juice*.
 Cinchōnæ officinālis cortex, ʒ i to 3 ij.
 decoctum, 3 i to iv.
 infūsum, 3 i to iv.
 tinctūra, 3 i to 3 ij.
 tinctūrā ammoniata, 3 ss to ij.
 tinctūra composita, 3 i to iij

- Cinchōnæ officinālis extractum, gr^r x to ʒ i.
 extractum cum resīna, gr^r v to ʒ i.
- Cissampēli pareiræ radix, gr^r xv to ʒ ij.
- Cisti creticæ resīna (Ladānum), gr^r x to ʒ fs.
- Citri aurantiī folia, flores, gr^r x to ʒ i.
 fructus cortex exterior, ʒ fs to ʒ ij.
 aqua destillata, ʒ i to iij.
 syrūpus corticis, ʒ i to ij.
 tinctūra corticis, ʒ i to ij.
 conserva corticis, ʒ ij to v.
- Citri medicæ, succus expressus, ʒ i to ʒ fs.
 succus spissatus, ʒ i to ʒ ij.
 syrūpus succi, ʒ i to iij.
 fructus cortex exterior, ʒ fs to ij, *in infusion.*
 aqua destillata, ʒ i to iij.
 oleum volatile, gr^t ii to gr^t v.
- Cochleariæ officinālis herba, ʒ i to iv, *of the juice.*
 succus compositus, ʒ i to iv.
- Cochleariæ armoraciæ radix, ʒ i to ʒ i.
 spiritus compositus, ʒ iij to ʒ i.
- Colchici autumnālis radix, gr^r fs to iij.
 syrūpus, ʒ i to ʒ i.
 oxymel, ʒ i to ʒ fs.
- Cōlombæ rādx, gr^r x to ʒ i.
 tinctura, ʒ i to iij.
- Confectio aromatica, gr^r xv to ʒ i.
 opiāta, gr^r x to ʒ fs.
- Conii maculati folia, gr^r iij.
 succus spissatus, gr^r ½ to gr^r iij.
- Convolvuli scammonīæ gummi resīna, gr^r v to gr^r xv.
 pulvis compositus, gr^r x to gr^r xv.
 pulvis cum aloe, gr^r x to xv.
 pulvis cum calomelāne, gr^r x to ʒ i.
 electuārium, ʒ fs to i.
- Convolvuli jalapæ radix, gr^r x to ʒ fs.
 pulvis compositus, ʒ fs to ʒ i.
 tinctura, ʒ i to iij.
 extractum, ʒ fs to ʒ i.
- Copaifēræ officinālis resīna, gr^t xv to ʒ fs.
- Coriandri sativi semina, ʒ i to ʒ i.
- Croci sativi floris stigmata, gr^r v to ʒ fs.
 syrūpus, ʒ i to ij.
 tinctura, ʒ fs to ij.
- Crotōnis eleutheriæ cortex, ʒ i to ʒ fs.

Crotōnis eleutheriæ extractum, gr x to 3 fs.

 tinctūra, 3 i to 3 fs.

Cūcūmis cōlōcynthidis fructus medulla, gr iij to viij.

 extractum compositum, gr v to 3 fs.

Cumīni cymīni femina, ʒ i to 3 i.

Cupri sub-acētis, gr $\frac{1}{8}$ to $\frac{1}{2}$.

 ammoniarētum, gr $\frac{1}{2}$ to v.

 ammoniarēti pilulæ, No. i.

 aqua ammoniareti, gt v to gt xxx.

 sulphas, gt ij to x.

Curcumæ longæ radix, ʒ i to 3 i.

Daphnes mezerēi radicis cortex, gt i to x.

Daphnes mezerēi decoctum, 3 iv to 1b fs.

Datūræ stramonii herba, gr i to v.

Dauri-carotæ semina, ʒ i to 3 i.

Delphinii staphisagræ semina, gr iij to x.

Dianthi caryophylli flores, ʒ i to 3 i.

 syrūpus, 3 i to ij.

Digitālis purpuræ folia, gr fs to iij.

 infusum, 3 iij to 3 i.

 tinctura, gr x to xl.

Dōlīchi prurientis pubes leguminis rigida, gr v to x.

Dorsteniæ contrayervæ radix, ʒ i to 3 fs.

 pulvis compositus, ʒ i to ij.

Electuarium opiātum, ʒ i to ij.

Eryngii maritimi radix, 3 ij to iij.

Ferri limatura, gr iij to gr x.

 oxīdum nigrum purificātum, do.

 carbōnas, do.

 carbōnas præcipitātus, do.

 super-carbōnātis aqua, 1b i, daily.

 sulphas, gr i to v.

 et potassæ tartris, gr x to 3 fs.

 et ammoniæ muriæ, gr iij to xv.

 muriatis tinctūra, gt x to xx.

 et ammoniæ tinctura, gt xv to 3 i.

 vinum, 3 ij to vj.

 acetāti tinctura, gt x to xxx.

Ferulæ assæ foetidæ gummi resina, gr x to 3 fs.

 lac, 3 fs to 3 i fs.

 tinctura, 3 fs to 3 i.

 pilulæ compositæ, gr x to xx.

Fici caricæ fructus, No. vi, in decoction.

Fraxini orni succus concretus (manna), 3 fs to i fs.

- Fraxīni orni succi concreti syrupus, $\text{℥ i to } \text{℥ ij}$.
 Fumariæ officinālis herba, $\text{℥ i to } \text{℥ ij}$, *of the expressed juice*.
 Gentianæ lutēæ radix, $\text{gr x to } \text{℥ ij}$.
 infūsum compositum, $\text{℥ fs to } \text{ij}$.
 tinctūra composita, $\text{℥ i to } \text{ijj}$.
 vinum compositum, $\text{℥ 6 to } \text{℥ i}$.
 extractum, $\text{gr x to } \text{℥ ij}$.
 Geoffrææ inermis cortex, $\text{℥ i to } \text{ij}$.
 decoctum, ℥ i .
 Glycyrrhizæ glabræ radix, $\text{℥ fs to } \text{i}$.
 extractum, $\text{℥ i to } \text{ijj}$.
 trochisci, $\text{℥ i to } \text{ij}$.
 trochisci cum opio, ℥ i , *during the day*.
 Gratiolæ officinalis herba, $\text{gr x to } \text{℥ i}$.
 Guaiaci officinālis resina, $\text{gr x to } \text{℥ fs}$.
 tinctūra, $\text{℥ ij to } \text{℥ fs}$.
 tinctūra ammoniata, $\text{℥ i to } \text{ij}$.
 decoctum compositum, $\text{℥ iv to } \text{vj}$.
 Hæmatoxyli Campechiāni extractum, $\text{℥ i to } \text{ij}$.
 Hellēbōri nigri radix, $\text{gr x to } \text{℥ i}$.
 extractum, $\text{gr v to } \text{gr x}$.
 tinctura, $\text{℥ fs to } \text{ifs}$.
 Hellebori foetidi folia, $\text{℥ i to } \text{ij}$.
 Nōrdēi distīchi decoctum, $\text{℥ ij to } \text{vj}$.
 compositum, $\text{℥ iij to } \text{vj}$.
 Hydrargyrum purificatum, $\text{℥ ij to } \text{iv}$.
 cum crēta, $\text{gr x to } \text{℥ fs}$.
 Hydrargyri oxidum cinereum, $\text{gr i to } \text{gr v}$.
 pilulæ, $\text{gr v to } \text{xv}$.
 oxidum rubrum, gr fs .
 sub-sulphas, $\text{gr i to } \text{gr v}$.
 sub-murias, $\text{gr i to } \text{gr v}$.
 præcipitatus, *do*.
 acētis, $\text{gr i to } \text{vj}$.
 muriās, $\text{gr } \frac{1}{8} \text{ to } \frac{1}{2}$.
 sulphurētum nigrum, $\text{℥ i to } \text{℥ i}$.
 rubrum, $\text{gr x to } \text{℥ fs}$.
 Hyosciāmi nigri herba, semen, $\text{gr iij to } \text{gr x}$.
 succus spissatus, $\text{gr i to } \text{v}$.
 tinctura, $\text{℥ i to } \text{℥ i}$.
 Hyperici perforati flores, $\text{℥ i to } \text{℥ i}$.
 Hyssōpi officinālis herba, $\text{℥ i to } \text{℥ i}$.
 Inulæ hēlēnii radix, $\text{℥ i to } \text{℥ i}$.
 Irīdis florentinæ radix, $\text{℥ i to } \text{℥ i}$.

Iridis pseudacōri radicis succus expressus, gr lx to lxxx.

Isis nobilis (corallium), gr x to 3 i.

Juglandis regiae fructus immatūrus, *externally in decoction.*

Juniperi communis baccae, 3 ss to i.

oleum volatile, gtt ij to x.

spiritus compositus, 3 ij to vi.

Juniperi lyciæ gummi refina (Olibanum), ʒ i to ij.

Juniperi sabinae folia, gr xv to ʒ ij.

extractum, gr x to 3 ss.

tinctura composita, gr xxx to 3 i.

Kino, gr x to ʒ i

tinctura, 3 i to iiij.

Lactūcae virosae succus spissatus, gr iiij to xv.

Lauri cinnamomi cortex, gr v to ʒ i.

aqua destillata, 3 i to iiij.

spiritus, 3 ij to 3 i.

tinctura, 3 i to 3 iiij.

tinctura composita, 3 ss to ij.

oleum volatile, gtt i to iiij.

Laurus cassia, *considerably weaker than the preceding species, in other respects similar.*

Lauri camphorae camphora, gr iiij to ʒ i.

emulsio, 3 ss to ij.

acidum acetosum, *odour analeptic.*

Lauri nobilis folia, baccae, gr x to 3 ss.

Lauri sassafras lignum, radix, eorumque cortex, ʒ i to 3 k

oleum volatile, gt ij to gt x.

Lavandulae spicae florentes, ʒ i to 3 i.

spiritus, *an analeptic perfume.*

spiritus compositus, 3 ss to ij.

oleum volatile, gt i to v.

Leontodi taraxaci radix, herba, 3 i to ij, *of the juice.*

Lilii candidi radix, *externally as a poultice.*

Lini usitatissimi semina, *in infusion, 3 i to water lb i.*

oleum fixum, 3 ss to i; *or, in clysters, 3 iiij to vj.*

Lini cathartici herba, 3 i, *or an infusion of a handful of the fresh plant.*

Lobeliae siphiliticae radix, 3 ss, *boiled in lb xij of water to lb viij; half a pint twice a-day.*

Magnesia, gr x to ʒ i.

Magnesiae carbonas, ʒ i to 3 i.

trochisci, 3 i to ij.

fulphas, 3 ss to 3 i.

Malvae sylvestris folia, flores, 3 ss to i,

- Marrūbii vulgāris herba, 3 fs to i.
 Mel despumatū, 3 ij to 3 i, *in clysters* 3 iij.
 acetatū, 3 i to ij.
 Melāleucæ leucādendri oleum volatile, gt i to v.
 Melissæ officinālis herba, gr x to 3 ij.
 Melōes vesicatorii pulvis, gr fs to i.
 tinctura, gt x to xxx.
 Menthæ viridis herba, gr x to 3 i.
 aqua, 3 i to ij.
 spiritus, 3 ij to 3 i.
 oleum volatile, gt ij to v.
 Menthæ piperitæ herba, gr x to 3 ij.
 aqua, 3 i to ij.
 spiritus, 3 ij to 3 i.
 oleum volatile, gt i to gt iij.
 Menthæ pūlēgii herba, gr x to 3 ij.
 aqua, 3 i to ij.
 spiritus, 3 ij to 3 i.
 oleum, gt ij to v.
 Menyanthis trifoliatæ herba, 3 fs to 3 i.
 Mimosæ catēchu extractū, gr xv to 3 fs.
 electuāriū, 3 i to 3 i.
 infusum, 3 i to ij.
 tinctura, 3 i to iij.
 Mimosæ niloticæ gummi, 3 i to ij.
 emulsio, lb ij *daily*.
 mucilāgo, 3 fs.
 Momordicæ elaterii succus spissatus, gr fs to gr vj.
 Mori nigræ syrupus, 3 i to 3 fs.
 Moschus, gr v to 3 i.
 Moschi tinctura, 3 i to 3 fs.
 mistūra, 3 fs to ifs.
 Murias ammoniæ, gr x to 3 fs.
 Murias sodæ, 3 iij to 3 fs, *in clysters*.
 Myristicæ moschatæ fructus nucleus, gr v. ad 3 i.
 oleum volatile, gt ij ad gt v.
 spiritus, 3 ij ad 3 i.
 nūcis involucrum, macis, dictum.
 involucris oleum expressum, *externally*.
 Myroxylī peruiferi balsamum, gr v to 3 fs.
 tinctura, 3 fs to 3 i.
 Myrrha, gr x to 3 fs.
 Myrrhæ tinctura, 3 fs to ifs.
 pulvis compositus, gr xv to 3 ij.

Myrti pimentæ fructus, gr v to ʒ i.

aqua destillata, ʒ i to iij.

spiritus, ʒ ij to ʒ i.

oleum volatile, gr iij to v.

Nicotianæ tabaci folia, gr fs to v.

vinum, gr xxx to gr lxxx.

Oleæ Europææ oleum fixum, ʒ iij to ʒ i.

Oleum animale, gr x to xl.

vini, gr i to iv.

Onisci aselli (Millepædæ) præparati, ʒ i to ij.

Opium, gr fs to gr ij.

Opii pilulæ, gr v to ʒ i.

tinctura, gr xx to xl.

ammoniata, ʒ fs to ij.

camphorata, ʒ fs to ij.

Origani vulgâris herba, gr x to ʒ i.

oleum volatile, gr i to ij.

majoranæ herba, ʒ i to ʒ i.

Ostrææ edulis testæ præparatæ, ʒ fs to i.

Ovis arietis sævum præparatum, *externally*.

Oxalis acētōsellæ folia, ʒ fs to i fs of the juice.

conserva, ʒ ij to ʒ fs.

Pænææ sarcocollæ gummi resina (sarcocolla), gr x to ʒ fs.

Panacis quinquefolii radix, ʒ i to ʒ i.

Papaveris rhœæ flores, ʒ i in decoction.

syrupus, ʒ i to iij.

Papaveris somniferi syrupus, ʒ fs to i to adults; ʒ i to ij to children; one ounce is supposed to contain one grain of opium.

extractum, gr i to v.

succus spissatus (Opium), gr fs to gr ij.

Parietariæ officinalis herba, gr x to ʒ i, or ʒ i to iij of the juice.

Pastinacæ opoponacis gummi resina, gr x to ʒ fs.

Phasiani galli ovorum testæ præparatæ, ʒ fs to i.

Physeteris macrocephali sævum (spermaceti), ʒ fs to i fs.

Pimpinellæ anisi semina, gr xv to ʒ fs.

spiritus compositus, ʒ ij to ʒ i.

oleum volatile, gr v to gr x.

Pini balsamææ resina liquida (Balsamum Canadense), gr v to ʒ fs.

Pini laricis resina liquida (Terebinthina veneta), ʒ i to ij; and in clysters, ʒ fs to i.

Pini sylvestris resina liquida (Terebinthina vulgâris), gr xv to ʒ ij; and in clysters, ʒ fs to i.

resina empyreumatica (Pix liquida), ʒ i to ʒ i.

Pini oleum volatile (Oleum terebinthinæ) rectificatum, gr x to ʒ i.

- Pipēris nigri baccæ, gr v to ʒ i.
 cubebæ baccæ, gr v to ʒ i.
 longi fructus, gr v to ʒ i.
 Pistaciæ lentisci resina (Mastiche), gr v to ʒ ss.
 terēbinthi (Trebinthina Chia), ʒ i to ʒ i.
 Plumbi acetis, gr ss to ij.
 Polygalæ senegæ radix, ʒ i to ʒ ss.
 decoctum, ʒ i to ij.
 Polygōni bistortæ radix, gr xv to ʒ i.
 Polypodii filices maris radix, ʒ i to ʒ ij.
 Potassæ aqua, gr x to xxx.
 acetis, ʒ i to ʒ ij.
 super-carbonātis aqua, ʒ vj to lb ss.
 sulphurētum, gr v to xv.
 tartris, ʒ i to ʒ ss.
 super-tartris, ʒ i to ʒ i.
 sulphas, ʒ i to ʒ ss.
 carbonas, gr v to ʒ i.
 carbonātis aqua, ʒ ss to ʒ i.
 nitrās, gr v to ʒ ss.
 nitrātis trochisci, ʒ i to ij.
 sulphas cum sulphure, gr xv to ʒ ss.
 Potentillæ reptantis radix, ʒ ss to i.
 Pruni domesticae fructus, ʒ ij to iij, *sterwed*.
 spinosa fructus.
 conserva, ʒ ij to ʒ ss.
 Pterocarpī draconis resina, gr x to ʒ ij.
 Pulvis aromaticus, gr v to gr x.
 opiātus, gr v to gr x.
 Pūnicæ granāti fructus cortex, ʒ i to ʒ i.
 floris petala, ʒ ss to i ss.
 Quassia simarubæ cortex, ʒ ss to i; *or, ʒ ij in decoction.*
 excellsæ lignum, gr v to ʒ i; *or, ʒ i to ij of an infusion of*
 ʒ ij *in lb i water.*
 Quercus roboris cortex, gr xv to ʒ ss; *or, ʒ i to ij of an infusion of*
 ʒ ij *in lb i water.*
 Quercus cerris gallæ, gr x to ʒ ss.
 Rhamni cathartici succus expressus, ʒ ss to i.
 syrūpus, ʒ ss to i ss.
 Rhei palmāti radix, gr x to ʒ ij.
 infusum, ʒ ss to i ss.
 pilulæ compositæ, gr x to ʒ ss.
 tinctura, ʒ ss to i ss; *or as a stomachic, ʒ ij to ʒ ss.*
 composita, ʒ ss to i ss.

- Rhei palmāti tinctura cum aloe, ʒ ss to i .
 cum gentiana, ʒ ss to iss ; or, ʒ ij to ʒ ss ,
as a stomachic.
 vinum, ʒ ss to i ss .
- Rhōdōdendri chrysanthi folia, gr v to x ; or an infusion of ʒ ij in
 ʒ x of water.
- Rhi toxicodendri folia, gr ss to i .
- Ribis nigri succus spissatus, ʒ ss to i .
 syrupus, ʒ i to ʒ ss .
- Ricini communis oleum expressum. ʒ ss to ʒ i .
- Rosæ gallicæ petala, ʒ i to ʒ i .
 conserva, ʒ ij to ʒ ss .
 infusum, ʒ ij to vj .
 syrūpus, ʒ i to ij .
 mel, ʒ i to ij .
- Rosæ damascenæ petala, ʒ i to ʒ i .
 aqua destillata, ʒ i to ij .
 syrupus, ʒ ij to ʒ ss .
- Rosæ caninæ (Cynosbatus) conserva, ʒ ij to vj .
- Roris marīni officinālis summitates, gt x to ʒ ij ; and in infusion
 ʒ i to i ss .
 oleum volatile, gtt ij to gt v .
 spiritus.
- Rubīæ tinctōrum radix, ʒ i to ʒ ss .
- Rūbi idæi syrupus, ʒ i to ss .
- Rumicis acetosæ folia, ʒ i to ʒ ij of the juice.
- Rūtæ grāvēolentis herba, gr xv to ʒ ij .
 extractum, gr x to ʒ i .
- Sagapēnum gummi resina, gr x to ʒ ss .
- Salicis fragilis cortex, ʒ i to ʒ i .
- Salviæ officinālis folia, gr xv to ʒ ij .
- Sambūci nigri cortex interior, gr v to ʒ i .
 succus spissatus, ʒ ss to i ss .
- Sapo, gr x to ʒ ss .
- Scillæ maritimæ radix recens, gr v to gr xv .
 radix ficcata, gr i to gr ij .
 syrūpus, ʒ i to ij .
 mel, ʒ ss to ij .
 oxymel, ʒ ss to ij .
 acetum, ʒ ss to ʒ iss .
 conserva, ʒ ss to i .
 tinctura, gtt x to xx .
 pilulæ, gr x to ʒ i .
- Sināpēos albæ femina, ʒ ss to ʒ i .
 oleum fixum, ʒ ss to i .

Sii nodiflōri herba, ʒ ij or iij of the juice.

Sisymbrii nasturtii herba, ʒ i or ij of the juice.

Smilacis sarsaparillæ radix, ʒ i to ʒ fs.

decoctum, ʒ iv to ʒ fs.

compositum, ʒ iv to ʒ fs.

Sodæ carbōnas, gr x to ʒ fs.

super-carbonātis aqua, ʒ iv to ʒ fs.

et potassæ tartris, ʒ vj to ʒ i fs.

fulphas, ʒ fs to ifs.

phosphas, x fs to ifs.

murias, ʒ iij to ʒ fs; *in glysters.*

sub-boras, gr x to ʒ fs.

Solani dulcamaræ stipites, ʒ fs to ʒ in infusion.

Spartii scoparii summitates, ʒ i to ʒ i.

extractum, ʒ fs to i.

Spigeliæ marilandicæ radix, ʒ fs to ʒ ij.

Spiritus ætheris sulphurici compositus, ʒ fs to ifs.

nitrosi, ʒ fs to ʒ i.

Spongia usta, ʒ fs to i.

Stalagmitidis cambogiodis succus spissatus, (Gambogia) gr v to gr x.

Stanni pulvis et limatura, ʒ i to ij.

Styracis officinalis balsamum, gr x to ʒ fs.

benzoini balsamum, gr x to ʒ fs.

tinctura composita, ʒ fs to i.

Succinum præparatum, ʒ i to ʒ i.

Succini oleum rectificatum, gr x to xx.

fulphas aluminæ, ʒ fs to ʒ i.

Sulphur præcipitatum, ʒ i to iij.

sublimatum lotum, ʒ i to ʒ i.

Sulphuris trochisci, ʒ i to iij.

Swieteniæ mahagōni cortex, ʒ i to ij.

febrifugæ cortex, ʒ i to ij.

Tamarindi indicæ fructus, ʒ fs to ifs.

infusum cum cassia fenna, ʒ ij to iv.

Tanacetii vulgaris herba, ʒ fs to i.

Teucrii maris herba, gr x to ʒ fs.

scordii herba, ʒ i to ʒ i.

Toluiferæ balsami balsamum, gr xv to ʒ ij.

syrupus, ʒ i to iij.

tinctura, ʒ fs to ij.

Tormentillæ erectæ radix, ʒ i to ij.

Tussilaginis farfuraræ herba, ʒ ij to iv of the expressed juice.

Ulmī campestris cortex interior, ʒ i to ʒ i.

decoctum, ʒ iv to ʒ fs.

Urticæ dioicæ herba, $\frac{3}{4}$ i to ij of the expressed juice.

Valerianæ officinalis radix, $\frac{3}{4}$ i to $\frac{3}{4}$ i.

tinctura, $\frac{3}{4}$ ij to $\frac{3}{4}$ fs.

ammoniata, $\frac{3}{4}$ i to ij.

extractum.

Veratri albi radix, gr v to $\frac{3}{4}$ i.

tinctura, gr v to x.

Veronicæ beccabungæ herba, $\frac{3}{4}$ ij to iv of the juice daily.

Violæ odoratæ syrupus, $\frac{3}{4}$ i to ij.

Wintēræ aromaticæ cortex, gr x to $\frac{3}{4}$ i.

Zinci oxidum, gr iij to x.

fulphas, gr vj to $\frac{3}{4}$ fs.

N. B. These are in general the doses for adults from twenty to sixty, but they may be diminished for children and people past the prime of life, nearly in the following proportions.

Ages.		Proportionate doses.
Months	2	$\frac{1}{12}$
	7	$\frac{1}{12}$
	14	$\frac{1}{8}$
	28	$\frac{1}{4}$
Years	3	$\frac{1}{4}$
	5	$\frac{1}{3}$
	7	$\frac{1}{2}$
	14	$\frac{2}{3}$
	63	$\frac{11}{12}$
	77	$\frac{5}{6}$
	100	$\frac{4}{6}$

It may also be observed, that sixty drops of water, one hundred of diluted alcohol, or an hundred and twenty of alcohol, are equal to a drachm by measure

*TABLE of Names changed in the last Edition of the
London Pharmacopœia.*

Names changed.

A.

ACETUM scilliticum.
Æthiops mineralis.
Aqua aluminosa bateana.
 calcis simplex.
 cinnamomi simplex.
 spirituosa.
fortis.
hordeata.
juniperi composita.
menthæ piperitidis simplex.
 spirituosa.
 vulgaris simplex.
 spirituosa.
nucis moschatæ.

piperis Jamaicensis.
pulegii simplex.
 spirituosa.
raphani composita.
rosarum damascenarum.
sapphirina.
feminum anethi.
 anisi composita.
 carui.
vitriolica camphorata.

New names.

ACETUM scillæ.
Hydrargyrus cum sulphure.
Aqua aluminis composita.
 calcis.
 cinnamomi.
Spiritus cinnamomi.
Acidum nitrosum dilutum.
Decoctum hordei.
Spiritus juniperi compositus.
Aqua menthæ piperitidis.
Spiritus menthæ piperitidis.
Aqua menthæ fativæ.
Spiritus menthæ fativæ.
 nuclei fructus myristicæ,
 sive nucis moschatæ.
Aqua pimento.
 pulegii.
Spiritus pulegii.
 raphani compositus.
Aqua rosæ.
 cupri ammoniati.
 anethi.
Spiritus anisi compositus.
 carui.
Aqua zinci vitriolati cum cam-
phora.
Hydrargyri purificatio.
Adipis suillæ præparatio.

Names changed.

New names.

B.

Balsamum fulphuris barbadense.
simplex.
traumaticum.

Petroleum sulphuratum.
Oleum sulphuratum.
Tinctura benzoës composita.

C.

Calx antimonii.
Cataplasma e cymino.
Causticum antimoniale.
commune fortius.
lunare.

Antimonium calcinatum.
Cataplasma cumini.
Antimonium muriatum.
Calx cum kali puro.
Argentum nitratum.
Ceratum spermatis ceti.
resinæ flavæ.
lapidis calaminaris.

Ceratum album.

citrinum.
epuloticum.

Ferri rubigo.
Hydrargyrus sulphuratus ruber.
Cataplasma aluminis.
Confectio aromatica.
Cornu cervi ustio.

Chalybis rubigo præparata.
Cinnabaris factitia.
Coagulum aluminosum.
Confectio cardiaca.
Cornu cervi calcinatio.

D.

Decoctum album.
commune pro clystere.
corticis peruviani.
pectorale.

Decoctum cornu cervi.
pro enemate.
cinchonæ sive corticis
peruviani.
hordei compositum.

E.

Electuarium lenitivum.
Elixir aloës.
myrrhæ compositum.
paregoricum.
Emplastrum ex ammoniaco cum
mercurio.
Emplastrum attrahens.
cephalicum.
commune.
adhæsivum.
commune cum gum-
mi.
commune cum mer-
curio.
e cymino.
roborans.
e sapone.
stomachicum.
vesicatorium.

Electuarium fennæ.
Tinctura aloës composita.
sabinæ composita.
opii camphorata.
Emplastrum ammoniaci cum hy-
drargyro.
Emplastrum ceræ compositum.
picis burgundicæ
compositum.
lithargyri.
cum resina.
lithargyri compo-
situm.
lithargyri cum hy-
drargyro.
cumini.
thuris compositum.
saponis.
ladani compositum.
cantharidis.

Names changed.

Extractum cartharticum.

ligni campechensis.

corticis peruviani.

thebæicum five opium
colatum.

F.

Flores benzöini.
martiales.
otus communis.

H.

Liera picra.

I.

Infusum amarum simplex.
senæ communis.
alepum e camphora.
e creta.
e moscho.

L.

Linimentum album.
saponaceum.
volatile.
lixivium saponarium.
tartari.

M.

Mel ægyptiacum.
rosaceum.
mercurius calcinatus.
corrosivus sublimatus.
ruber.
dulcis sublimatus.
emeticus flavus.
præcipitatus albus.

N.

Natrium vitriolatum.

O.

Oleum petrolei barbadensis.
terebinthinæ æthereum.
ium colatum.
Oxymel scilliticum.
simplex.

New names.

Extractum colocynthis compositum.

hæmatoxyli five ligni
campechiani.

cinchonæ five corticis
peruviani.

Opium purificatum.

Flores benzoës.

Ferrum ammoniacale.

Decoctum pro fomento.

Pulvis aloës cum canella.

Infusum gentianæ compositum.
fennæ tartarifatum.

Mistura camphorata.
cretacea.
moschata.

Unguentum spermatis ceti.
Linimentum saponis.
ammoniacæ.

Aqua kali puri.
kali præparati.

Oxymel æruginis.

Mel rosæ.

Hydrargyrus calcinatus.

muriatus.

nitratus ruber.

Calomelas.

Hydrargyrus vitriolatus.

Calx hydrargyri alba.

Kali vitriolatum.

Oleum petrolei.

terebinthinæ rectificatum.

Opium purificatum.

Oxymel scillæ.

Mel acetatum.

Names changed.

New names.

P.

Philonium londinense.

Pilulæ aromaticæ.
ecphracticæ.
gummosæ.
rufi.

Pulvis e bolo compositus.

cum opio.
e cerussa compositus.
e chelis cancrorum compositus.
sternutatorius.

R.

Rob baccarum sambuci.

S.

Saccharum saturni.

Sal absinthii.

catharticus amarus.
glauberi.

diureticus.

martis.

tartari.

vitrioli.

volatilis falis ammoniaci.

Species aromaticæ.

Spiritus cornu cervi.

lavendulæ simplex.

nitri dulcis.

glauberi.

falis ammoniaci.

falis ammoniaci dulcis.

falis marini glauberi.

vinosus camphoratus.

vitrioli dulcis.

volatilis aromaticus.

fœtidus.

Succi scorbutici.

Syrupus ex althæa.

e corticibus aurantiorum.

balsamicus.

e meconio.

rosarum solutivus.

T.

Tabellæ cardialgicæ.

Tartarum emeticum.

Confectio opiata.

Pulvis aloëticus cum guaiaco.
aloës cum ferro.

Pilulæ Galbani compositæ.
aloës cum myrrha.

Pulvis cretæ compositus.

cum opio.
cerussæ.
cancri chelarum compositus.
afari compositus.

Succus baccæ sambuci spissatus.

Cerussa acetata.

Kali præparatum.

Magnesia vitriolata.

Natron vitriolatum.

Kali acetatum.

Ferrum vitriolatum.

Kali præparatum.

Zincum vitriolatum.

Ammonia præparata.

Pulvis aromaticus.

Liquor volatilis cornu cervi.

Spiritus lavendulæ.

ætheris nitrosi.

Acidum nitrosum.

Aqua ammoniæ.

Spiritus ammoniæ.

Acidum muriaticum.

Spiritus camphoratus.

ætheris vitriolici.

ammoniæ compositus.
fœtidus.

Succus cochleariæ compositus.

Syrupus althæa.

corticis aurantii.

tolutanus.

papaveris albi.

rosæ.

Trochisci cretæ.

Antimonium tartarifatum.

Names changed.

Tartarum vitriolatum.
 Tinctura amara.
 aromatica.
 corticis peruviani simplex.
 corticis peruviani volatilis.
 fœtida.
 florum martialium.
 guaiacina volatilis.
 japonica.
 martis in spiritu salis.
 melampodii,
 rhabarbari spirituosæ.
 vinosæ.
 rosarum.
 sacra.
 stomachica.
 thebaica.
 valerianæ volatilis.
 Trochisci bechici albi.
 nigri.

V.

Vinum antimoniale.
 chalybeatum.
 Unguentum album.
 basilicum flavum.
 cæruleum fortius.
 cæruleum mitius.
 e gummi elemi.
 e mercurio præcipitato.
 saturninum.
 simplex.
 ad vesicatoria.

New names.

Kali vitriolatum.
 Tinctura gentianæ composita.
 cinnamomi composita.
 cinchonæ sive corticis peruviani.
 cinchonæ, sive corticis peruviani, ammoniata.
 assæ fœtidæ.
 ferri ammoniacalis.
 guaiaci.
 catechu.
 ferri muriati.
 hellebori nigri.
 rhabarbari.
 Vinum rhabarbari.
 Infusum rosæ.
 Vinum aloës.
 Tinctura cardamomi composita.
 opii.
 valerianæ ammoniata.
 Trochisci amyli.
 glycyrrhizæ.

Vinum antimonii.
 ferri.

Unguentum ceræ.
 resinæ flavæ.
 hydrargyri fortius.
 hydrargyri mitius.
 elemi compositum.
 calcis hydrargyri alba.
 cerussæ acetatæ.
 adipis suillæ.
 cantharidis.

*TABLE of Names changed, and of some Synonimes, in
the last edition of the Edinburgh Pharmacopœia.*

<i>Names changed.</i>	<i>New names.</i>
A.	
ABSINTHIUM.	ARTEMISIA absinthium.
Acetosa.	Rumex acetosa.
Acetum vini.	Acidum acetosum.
Acidum vitriolicum;	fulphuricum.
vitrioli aromaticum.	aromaticum.
Ærugo.	Sub-Acetis cupri.
Æther vitriolicus.	Æther sulphuricus.
Æthiops mineralis.	Sulphuretum hydrargyri nigrum.
Agaricus.	Boletus igniarius.
Alkali causticum,	Potassa.
fixum fossile.	Carbonas sodæ.
vegetabile.	potassæ impurus.
volatile.	ammoniæ.
Alumen.	Sulphas aluminæ.
ustum.	exsiccatum.
Ammonia muriata.	Murias ammoniæ.
præparata.	Carbonas ammoniæ.
Amygdala dulcis.	Amygdalus communis.
Angelica fativa.	Angelica Archangelica.
Anisum.	Pimpinella anisum.
Antimonium.	Sulphuretum antimonii.
calcareo-phosphora-	Oxidum antimonii cum phosphate
tum.	calcis,
muriatum.	Murias antimonii.
tartarifatum.	Tartris antimonii.
Aqua ammoniæ.	Aqua carbonatis ammoniæ.
acetatæ.	acetitis ammoniæ.
causticæ.	ammoniæ.
cupri vitriolati composita,	Solutio sulphatis cupri composita.
vel aqua styptica.	
lixiviæ causticæ.	Aqua potassæ.
zinci vitriolati.	Solutio sulphatis zinci.
Arabicum gummi.	Gummi mimosæ niloticæ.

Names changed.

New names.

Affa foetida.
Aurantium Hispalense.
Axungia porcina.

Gummi-resina ferulæ affæ foetidæ.
Citrus aurantium.
Adeps suis scrofae.

B.

Balsamum Canadense.
Copaibæ.
Gileadense.
Peruvianum.
Tolutanum.
traumaticum.

Resina liquida pini balsameæ.
copaiferæ officinalis.
amyridis Gileadensis.

Balsamum myroxyli peruiferi.
toluiferæ balsami.

Tinctura benzoin composita.

Arctium lappa.

Carbonas sodæ impurus.

barytæ.

Atropa belladonna.

Balsamum styracis benzoin.

Polygonum bistorta.

Boras sodæ.

Murias antimonii.

Bardana.

Barilla.

Barytes.

Belladonna.

Benzoinum.

Bistorta.

Borax.

Butyrum antimonii.

C.

Cajeputa.

Calamus aromaticus.

Calomelas.

Calx viva.

Cancrorum lapilli.

Cantharis.

Cardamomum minus.

Carduus benedictus.

Carica.

Carvi.

Caryophylla aromatica.

rubra.

Cascarilla.

Cassia fistularis.

lignea.

Catechu.

Causticum commune acerrimum.

mitius.

lunare.

Centaurium minus.

Cerussa.

acetata.

Chamæmelum.

Cicuta.

Cinnabaris factitia.

Cinara hortensis.

Cineres clavellati.

Cinnamomum.

Melaleuca leucadendron.

Acorus calamus.

Sub-Murias hydrargyri.

Calx.

Carbonas calcis durior.

Meloë vesicatorius.

Amomum repens.

Centaurea benedicta.

Fructus ficus caricae.]

Carum carui.

Caryophyllus aromaticus.

Dianthus caryophyllus.

Croton eleutheria.

Cassia fistula.

Laurus cassia.

Mimosa catechu.

Potassa.

cum calce.

Nitras argenti.

Chironia centaurium.

Oxidum plumbi album, *vel* carbo-

nas plumbi.

Acetis plumbi.

Anthemis nobilis.

Conium maculatum.

Sulphuretum hydrargyri rubrum.

Cinara scolymus.

Carbonas potassæ impurus.

Laurus cinnamomum.

Names changed.

Coccinella.
 Colocynthis.
 Confectio japonica.
 Contrayerva.
 Cortex peruvianus.
 Creta alba.
 Crocus antimonii. }
 metallorum. }
 CrySTALLI tartari.
 Cucumis agrestis.
 Cuprum ammoniacum.
 vitriolatum.
 Cynosbatus.

D.

Daucus silvestris.
 Decoctum chamæmeli *vel* com-
 mune.
 lignorum.
 Dens leonis.

E.

Elaterium.
 Electuarium lenitivum.
 Elixir paregoricum.
 sacrum.
 salutis.
 stomachicum.
 Emplastrum adhæsivum.
 cereum.
 lithargyri *vel* com-
 mune.
 lithargyri compo-
 situm *vel* roborans.
 vesicatorium.
 Emulsio communis.

F.

Ferrum ammoniatum.
 Ferri rubigo.
 squamæ purificatæ.
 præparatæ.
 Ferrum vitriolatum.
 ustum.
 Filix mas.
 Flores martiales.
 sulphuris.

New names.

Coccus cacti.
 Cucumis colocynthis.
 Electuarium mimosæ catechu.
 Dorstenia contrayerva.
 Cortex cinchonæ officinalis.
 Carbonas calcis mollior.
 Oxidum antimonii cum sulphure
 per nitratem potassæ.
 Super-Tartris potassæ.
 Momordica elaterium.
 Ammoniaretum cupri.
 Sulphas cupri.
 Rosa canina.

Daucus carota.
 Decoctum anthemidis nobilis.
 guaiaci compositus.
 Leontodon taraxacum.

Succus spissatus momordicæ ela-
 terii.
 Electuarium cassiæ fennæ.
 Tinctura opii ammoniata.
 rhei et aloës.
 fennæ composita.
 gentianæ composita.
 Emplastrum resinofum.
 simplex.
 oxidi plumbi semivi-
 tre.
 oxidi ferri rubri.
 meloës vesicatorii.
 Emulsio amygdalæ communis.

Carbonas ferri.
 Ferri oxidum nigrum purificatum.
 præparatum.
 Murias ammoniæ et ferri.
 Sulphas ferri.
 Oxidum ferri rubrum.
 Polypodium filix mas.
 Murias ammoniæ et ferri.
 Sulphur sublimatum.

Names changed.

New names.

G.

Galbanum.
Genista.
Granata malus.
Gummi Arabicum.

Gummi-resina bubonis galbani.
Spartium scoparium.
Punica granatum.
Gummi mimosæ Niloticæ.

H.

Helleborus albus.
Hepar sulphuris.
Hippocastanum.
Hydrargyrus acetatus.
 muriatus corrosivus.
 mitis.

 præcipita-
 tus.
 nitratus ruber.

præcipitatus cinereus.
sulphuratus niger.
vitriolatus flavus.

Veratrum album.
Sulphuretum potassæ.
Æsculus hippocastanum.
Acetis hydrargyri.
Murias hydrargyri.
Sub-Murias hydrargyri, five calo-
melas.
Sub-Murias hydrargyri præcipita-
tus.
Oxidum hydrargyri rubrum per
acidum nitricum.
Oxidum hydrargyri cinereum.
Sulphuretum hydrargyri nigrum.
Sub-Sulphas hydrargyri flavus.

I.

Infusum amarum.
rosarum.

Infusum gentianæ compositum.
rosæ Gallicæ.

J.

Jalapa.

Convolvulus jalapa.

L.

Lapis calaminaris.
Lavendula.
Laudanum liquidum.
Lignum Campechense.

Limon.
Linimentum anodynum *vel* opia-
tum.
saponaceum.
volatile.

Lithargyrus.
Lixiva acetata.
e tartaro.
purificata.
tartarifata.
vitriolata.
sulphurea.
Lixivium causticum.

Carbonas zinci impurus.
Lavandula spica.
Tinctura opii.
Lignum Hæmatoxyli Campechiani.
Citrus medica.
Tinctura saponis et opii.
Tinctura saponis.
Oleum ammoniatum.
Oxidum plumbi semivitreum.
Acetis potassæ.
Carbonas potassæ purissimus.
Carbonas potassæ.
Tartris potassæ.
Sulphas potassæ.
cum sulphure.
Aqua potassæ.

Names changed.

New names.

M.

Magnesia alba.
 ufta.
 vitriolata.
 Majorana.
 Manna.
 Marmor album.
 Mastiche.
 Melampodium.
 Mercurius.
 præcipitatus ruber.
 fublimatus corrosivus.
 Mezereum.
 Minium.
 Muria,

Carbonas magnesiæ.
 Magnesia.
 Sulphas magnesiæ.
 Origanum majorana.
 Succus concretus fraxini orn.
 Carbonas calcis durior.
 Refina pistachiæ lehtisci.
 Helleborus niger.
 Hydrargyrus.
 Oxidum hydrargyri rubrum.
 Murias hydrargyri.
 Daphne mezereum.
 Oxidum plumbi rubrum.
 Murias fodæ.

N.

Nasturtium aquaticum.
 Nitrum.
 Nux moschata.

Sifymbrium nasturtium.
 Nitræ potassæ.
 Nucleus fructus myristicæ moschata.

O.

Olea stillatitia.
 Oleum succini rectificatum.
 terebinthinæ rectificatum.
 Olibanum.
 Oliva.

Olea volatilia.
 Oleum succini purissimum.
 volatile pini purissimum.
 Gummi-refina juniperi lyciæ.
 Olea Europæa.

P.

Palma.
 Patroleum Barbadiense.
 Petroselinum.
 Pilulæ cupri.
 thebaicæ.
 Pimento *vel* piper Jamaicensis.
 Piper Indicum.
 Pix Burgundica.
 liquida.
 Plumbum uftum.
 Potio cretacea.
 Prunus Gallica.
 Pulegium.
 Pulvis antimonialis,

Cocos butyracea.
 Bitumen petroleum.
 Apium petroselinum.
 Pilulæ ammoniaretæ cupri.
 opiatæ.
 Myrtus pimenta.
 Capsicum annuum.
 Resina sponte concreta pini abietis.
 empyreumatica pini sylvestris.
 Oxidum plumbi semivitreum.
 Potio carbonatis calcis.
 Prunus domestica.
 Mentha pulegium.
 Oxidum antimonii cum phosphate calcis.
 Pulvis carbonatis calcis composi-

Names changed.

New names.

R.

Raphanus rusticanus.
Refina alba.
Rhabarbarum.
Rosa pallida.
 rubra.
Rubigo ferri præparata,

S.

Sabina.
Saccharum saturni.
Sal alkalinus fixus fossilis.
 vegetabilis.
 ammoniacus.
 catharticus amarus.
 cornu cervi.
 Glauberi.
 marinus Hispanus.
 polychrestus.
 Rupellensis.
 fuccini.
 tartari.
Sanguis draconis.
Santalum rubrum.
Santonicum.
Sarsaparilla.
Sassafras.
Scammonium.

Seneka.
Senna.
Serpentaria Virginiana.
Simarouba.
Sinapi album.
Soda.
 muriata.
 phosphorata.
 tartarifata.
 vitriolata.
Spiritus ætheris vitriolici.
 ammonia.
 cornu cervi.
 Mindereri.
 salis ammoniaci.
 vinosus rectificatus.
 tenuior.
 camphoratus.

Staphisagria.
Stramonium.

Cochlearia armoracia.
Refina pini.
Rheum palmatum.
Rosa centifolia.
 Gallica.
Carbonas ferri præparatus.

Juniperus sabina.
Acetis plumbi.
Carbonas sodæ.
 potassæ.
Murias ammonia.
Sulphas magnesiæ.
Carbonas ammonia.
Sulphas sodæ.
Murias sodæ.
Sulphas potassæ cum sulphure.
Tartris potassæ et sodæ.
Acidum succinicum.
Carbonas potassæ purissimus.
Refina pterocarpi draconis.
Pterocarpus fantalinus.
Artemisia fantonicum.
Smilax sarsaparilla.
Laurus sassafras.
Gummi-refina convolvuli scammo-
 niæ.
Polygala fenega.
Cassia fenna.
Aristolochia serpentaria.
Quassia simaruba.
Sinapis alba.
Carbonas sodæ.
Murias sodæ.
Phosphas sodæ.
Tartris potassæ et sodæ.
Sulphas sodæ.
Æther sulphuricus cum alcohol.
Alcohol ammoniatum.
Aqua carbonatis ammonia.
 acetitis ammonia.
 carbonatis ammonia.
Alcohol.
 dilutum.
Tinctura camphoræ.
Delphinium staphisagria.
Datura stramonium.

Names changed.

Sulphur antimonii præcipitatum. }
 auratum antimonii. }
 Syrupus balsamicus *vel* Tolutanus.
 papaveris albi.

T.

Taraxacum.
 Tartarus crudus.
 Tartari cryſtalli.
 Tartarum ſolubile.
 vitriolatum.
 Tartarus emeticus.
 Terebinthina Veneta.
 Terra Japonica.
 ponderoſa vitriolata.
 Tinctura aloës vitriolata.
 aromatica.
 ferri.
 cantharidum.
 Japonica.
 rhei amara.
 ſacra.
 Tolutana.
 Toxicodendron.
 Tragacantha.
 Trifolium.
 Trochiſci Arabici.
 Turpethum minerale.
 Tutia.

U.

Unguentum album *vel* ceruſſæ.
 æruginiſ.
 cœruleum.
 citrinum.
 epiſpaſticum fortius.
 mitius.
 ſaturninum.
 tutiæ.

Uva paſſa.
 urſi.

V.

Valeriana ſylveſtris.
 Vinum amarum.
 antimoniale.

New names.

Sulphuretum antimonii præcipita-
 tum.
 Syrupus toluiferæ baſſami.
 papaveris ſomniferi.

Leontodon taraxacum.
 Super-Tartris potaſſæ impurus.
 potaſſæ.
 Tartris potaſſæ.
 Sulphas potaſſæ.
 Tartris antimonii.
 Refina liquida pini laricis.
 Extractum mimofæ catechu.
 Sulphas barytæ.
 Tinctura aloës ætherea.
 cinnamomi compoſita.
 muriatis ferri.
 meloës veſicatorii.
 mimofæ catechu.
 rhei et gentianæ.
 Vinum aloës focotorinæ.
 Tinctura toluiferæ baſſami.
 Rhus toxicodendron.
 Aſtragalus tragacantha.
 Menyanthes trifoliata.
 Trochiſci gummofi.
 Sub-Sulphas hydrargyri flavus.
 Oxidum zinci impurum.

Unguentum oxidi plumbi albi.
 ſub-Acetitis cupri.
 hydrargyri.
 nitratis hydrargyri.
 pulveris meloës veſi-
 catorii.
 infuſi meloës veſica-
 torii.
 acetitis plumbi.
 oxidi zinci impuri.
 Fructus ſiccatus vitis viniferi.
 Arbutus uva urſi.

Valeriana officinalis.
 Vinum gentianæ compoſitum.
 tartritis antimonii.

Names changed.

New names.

Vitriolum viride.
Vitrum antimonii.

ceratum.

Sulphas ferri.
Oxidum antimonii cum sulphure
vitrificatum.
antimonii vitrificatum cum
cera.

W.

Winteranus cortex.

Cortex Winteræ aromaticæ.

Z.

Zincum ustum.
vitriolatum.
Zingiber.

Oxidum zinci.
Sulphas zinci.
Amomum zingiber.

NOTE.—(*Edin.*) In both these Indexes of changed names, (fearing lest they might become too long, and satisfied if every possible error might be avoided), we have only introduced those simples of which we have changed the principal and common names, called in natural history Generic names; such as, *Anthemis nobilis* for *Chamæmelum*, *Chironia Centaureum* for *Centaureum minus*, *Convolvulus Jalapa* for *Jalapa*; but we have omitted all those simples whose former generic names remain, and to which we have only added their specific or trivial names, such as, *Digitalis purpurea*, *Rheum palmatum*, *Papaver somniferum*.

For the same reason, we have thought it sufficient to introduce into these Indexes the changed name of every simple, having generally omitted the titles of the preparations and compositions which are formed of them. Thus, we have mentioned, that *Laurus Cinnamomum* is to be used in place of *Cinnamomum*; but we have omitted the *Aqua*, *Spiritus*, and *Tinctura Lauri Cinnamomi*, trusting that their new names cannot be a source of doubt or error to any person.



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